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DERMATOLOGY OF THE ANCIENTS*

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The present condition and the future prospects of dermatology have been ably discussed by former chairmen of this section. Since Hippocrates has said that the physician must know what his predecessors have known, if he does not wish to deceive both himself and others, it has seemed to me that an account of the dermatologic knowledge of our earliest predecessors might prove of interest if not of practical value.

An historical sketch of dermatology of the ancients properly begins with the Egyptians, as there is no doubt that the written account of their civilization is the oldest that is known. According to Comrie,[1] the medical practitioners in the early days of Egypt belonged to a learned class, enjoyed a high social position and were in many cases the friends and counselors of kings. This is shown by monuments that were erected to them, one of their number, indeed, I-em-hotep (3000 B. C.) having been later deified. As a rule, however, the names and personalities of the physicians, however skilful or famous they may have been, remain unknown.

The source of our knowledge of ancient Egyptian medicine is mostly derived from six papyri, all having been discovered and deciphered within recent years. The most important of these is the famous Papyrus Ebers,[2] a manuscript nearly 65 feet in length. It consists of 108 columns (or pages), each composed of about twenty lines of so-called hieratic script, beautifully written in red and black ink. This precious document, together with five other papyri, contain in less than 185 pages a most valuable amount of information about medicine and pharmacology of the ancient Egyptians. From various data it was calculated by Ebers that the Papyrus which bears his name was written about 1552 B. C., at a period before the exodus of the Jews from Egypt. It is now generally agreed that the Ebers Papyrus is not the work of any single author but a compilation of medical knowledge of many previous centuries. Like the Hearst Papyrus, as Reisner[3] says, it is "only a collection of practical remedies intended for the use of practicing physicians."

While the Egyptians doubtless had a considerable knowledge of practical medicine, they felt that its effectiveness was increased by the addition to some of their prescriptions of various magic incantations. Many of their drugs had a real therapeutic value, while others contained various disgusting ingredients whose purpose it was to drive out the wicked demons from the bodies of the unfortunate sufferers. An example of the latter class is shown by a prescription in the Berlin Papyrus, containing seven ingredients, five of which consisted of the dung of various animals.

The dermatologist should be especially interested in the medicine of the ancient Egyptians on account of the prevalence among them of skin diseases. We learn of this indirectly from Pliny and other writers, and have direct evidence from the numerous references to diseases of the skin and scalp that appear in the medical papyri. In a tabulated list of various diseases in the Papyrus Ebers, von Klein[4] mentions, among diseases of the scalp, "tumors, alopecia and eruptions," also prescriptions to prevent hair from turning gray, to produce its growth on bald heads, to promote the growth, to make it grow on cicatrices, to depilate the scalp and to dye the hair. Under facial diseases he mentions sunburn, freckles, wrinkles, discolorations, roughness and blotches; under diseases of the skin, pustules, prurigo, swellings, tumors with fetid suppurations, leprosy, eczema, scabies, itching cankers, boils and carbuncles. In addition, von Klein mentions gangrene, eschar formation, burns, spots or white cicatrices which such sores leave and alteration of the hair on the burnt surfaces, perspiration of the feet, sore toes, corns, bunions, callosities of all sorts and falling nails. In Chapter 12 of the Hearst Papyrus there are thirteen remedies, according to Reisner, "relating to the hair and skin, etc."

Some of the dermatologic prescriptions in the Ebers Papyrus are extraordinary, to say the least, in their composition. As an example, equal parts of the toes of a dog, ripe dates and asses' hoof were suggested as a remedy to make hair grow, the ingredients first being boiled carefully in a pan of oil. Another prescription for baldness, that has been frequently quoted, consisted of equal parts of cerebrospinal fluid and writing ink. Perhaps the most unusual recipe for the cure of baldness consisted of equal parts of the fat of a lion, hippopotamus, crocodile, goose, snake and ibex. Thus we see that goose grease, which has recently been recommended as a very penetrating ointment base, is not particularly new to the medical profession. Most of the ancient Egyptian prescriptions were ordered to be taken for a period of not more than four days, a fact that might account for the prevalence of skin diseases which, as we know,

* Chairman's address, read before the Section on Dermatology at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

1. Comrie, J. D.: Medicine Among the Assyrians and Egyptians in 1500 B. C., Edinburgh Med. Jour., 1909, ii, 101.

2. Ebers, G. M.: Papyrus Ebers, Das Aelteste Buch über Heilkunde (German trans. by Joachim), Berlin, 1890.

3. Reisner, G. A.: The Hearst Medical Papyrus, Leipzig, 1905, p. 4.

4. Von Klein, C. H.: The Medical Features of the Papyrus Ebers, THE JOURNAL A. M. A., Dec. 23, 1905, p. 1928.

are so often distressingly chronic. While most cases of scabies might have been cured by appropriate treatment of four days, we hate to think of the disappointment of the sufferers from psoriasis or chronic eczema, whose physicians felt content with such a short course of treatment.

"The question of syphilis," writes Comrie, "has been raised in connection with the advanced atheroma that has been found in the large arteries, the diffuse signs of periostitis and particularly in regard to a case of ulceration of the skull described recently by Professor Lortet. No absolutely conclusive evidence as to the existence of this disease in early Egypt has, however, yet been found, and Professor Elliot Smith has demonstrated that the supposed ulceration is probably due to the attack of insects ages after the bones were buried."

That specialism in medicine is not confined to modern times is shown by the account of Herodotus, who was one of the two chief authorities on Egyptian medicine in the fifth century before Christ. Referring to the medical practitioners of Egypt, Herodotus says, "The art of medicine is divided among them. Each physician applies himself to one disease only and not more. All places abound in physicians. Some physicians are for the eyes, others for the teeth, others for the belly and others for the internal disorders." The fame of at least one Egyptian specialist in skin diseases, it appears, was great enough for him to be summoned to Greece in consultation.

The conception of medicine among the ancient Egyptians was certainly much broader than that of the present day. Thus the subject of cosmetics was not considered beneath the dignity of the profession to practice as a special art. According to Paschkis, identical substances that are in vogue today as cosmetics were used thousands of years ago in Egypt. No less a personage than Cleopatra is said to have written a treatise on the subject, which has unfortunately perished. Furthermore, the duties of the medical fraternity included the work that is nowadays performed by professional vermin exterminators, and we find in the papyri recipes for preventing bees from stinging, flies from biting and rats from eating corn.

Among the ancient Hebrews the art and science of medicine occupies a peculiar position from the fact that all of our knowledge on the subject is derived from nonmedical sources. There were no ancient Hebrew books devoted especially to medicine, and we cannot properly speak of a system of Hebrew medicine comparable to that of the ancient Egyptians, Hindoos or Greeks. The sources of our information are chiefly the Bible and Talmud. The oldest Hebrew literature was the Pentateuch or Mosaic Law, revealed to Moses by Jehovah on Mount Sinai, and centuries after committed to writing. According to Jewish belief, other revelations beside this "written law" were made to Moses, which were handed down from generation to generation as oral traditions and eventually compiled and recorded in the third century of the Christian era. This compilation was known as the Mishnah, and consisted of a "collection of binding precepts and legal decisions deduced by the ancient rabbis from the Pentateuch and itself forming a second or oral law." In the course of time, numerous commentaries and discussions relating to the Mishnah were also compiled and committed to writing, which were known as the Gemara. The Mishnah and Gemara together constituted the Talmud, of which there were two, the Palestinian and Babylonian Talmuds. Of these the Babylonian Talmud was much more voluminous and of somewhat later date than the Palestinian compilation, being completed about the sixth century A. D.

The references to medical subjects in the Bible and Talmud deal mostly with the prevention rather than the treatment of diseases, and the remark of Bennett[5] seems quite proper that "the Mosaic sanitary code may be said to constitute the basis of modern sanitary legislation." One of the functions of the priest, who may be considered as a sort of health officer, was to decide whether a skin disease was "clean" or "unclean," though nothing is said about his having to treat these diseases. While it is quite likely that the priests and some of the prophets had more or less medical knowledge, the practice of medicine, such as it was, was carried on by the physician or rophé. That the esteem in which the physician was held varied considerably may be seen from a saying in the Talmud that the proper place for the best physician was in Hades, while according to another more flattering saying, the wise man was advised not to live in a town that has no physician or bloodletter.

Before discussing particular diseases of the ancient Hebrews, I should like to mention the difficulty of their recognition as pointed out by Higier.[6] As this writer says, we are often puzzled at the present day to make a diagnosis when a patient is presented to us for examination with a full history. When a history alone, without the patient is presented, our difficulties increase. When, however, the history was written many centuries ago by physicians whose terminology and conception of medicine were different from our own, we are still further embarrassed. But when such ancient histories of disease were written by laymen, we must admit in most cases our complete helplessness in making a proper diagnosis. It is such difficulties as these that are encountered in the study of biblical leprosy.

To the modern dermatologist, the subject of leprosy as described in the Old Testament is as fascinating as it is difficult. The question to be settled is whether the disease described by Leviticus as Zaraath and translated as leprosy in the Authorized Version really refers to the modern disease leprosy, with which we are all familiar. The thirteenth chapter of Leviticus contains fifty-nine verses which consist of hard and fast rules for the differentiation of leprosy from harmless diseases of the skin. An idea of their medical value may be obtained by reading the following verses:

1. And the Lord spake unto Moses and Aaron saying

2. When a man shall have in the skin of his flesh a rising (sëeth) a scab, (sappachath) or bright spot (bahéreth) and it be in the skin of his flesh like the plague of leprosy; then he shall be brought unto Aaron the priest or to one of his sons the priests:

3. And the priest shall look on the plague in the skin of the flesh: and when the hair in the plague is turned white, and the plague in sight be deeper than the skin of the flesh, it is a plague of leprosy: and the priest shall look on him and pronounce him unclean:

Reading further, we are told that if the symptoms of white hair and depression of the patches are not present, the individual is to be isolated for further

5. Bennett, Sir R.: The Diseases of the Bible, 1887.
6. Higier, H.: Was lehren uns die Bibel, der Talmud, und das Evangelium über Lepra und Syphilis? St. Petersburg Med. Wchnschr., 1907, xxiv, 67.

observation, and if at the end of two weeks the "scab" has spread, the case is pronounced leprosy.

McEwen,[7] who has recently written a most interesting and careful analysis of the subject, says that the "differential criteria, white hair, depression and spreading, are absurdly insufficient to constitute a dividing line between harmless skin diseases and leprosy." He then proceeds to tabulate the eleven pathologic conditions of the skin mentioned in the remaining verses of the chapter, which he states are "far too scant effectually to distinguish leprosy from the many other skin diseases which must have been prevalent at that time." With this opinion, I most heartily agree, as also with that expressed by my father, Dr. George Henry Fox,[8] who said in referring to the Mosaic law that "there are no scriptural references to any disease which is unmistakably the leprosy of the present day." If the description in Leviticus does not accord with the conception of modern leprosy, how much less do certain miraculous statements convey the idea of this disease, as when we read in Exodus 4-6, that Moses put his hand into his bosom at the command of the Lord "and when he took it out, behold his hand was leprous as snow."

Various modern writers, including von Bärensprung,[9] Danielson, Neumann,[10] and Bloch,[11] consider the Zaraath of the Bible to have been true leprosy. Preuss,[12] who is an authority on the medicine of the Bible and Talmud, is also of this opinion, and calls attention to the chronicity of the disease, to the fear in which it was held and to the fact that its victims were not bedridden. He argues that there are only two diseases, namely, syphilis and leprosy, which could inspire such fear, and, by the easy exclusion of syphilis, concluded that the disease Zaraath referred to true leprosy. On the other hand, Münch[13] considered the disease to be an endemic vitiligo, and Katzenelson and Sack[14] thought it a form of dermatomycosis from the references to spreading of the lesions and to leprosy of garments. Finaly[15] thought it syphilis, while Ebstein[16] considered that Zaraath represented a composite name for various skin diseases that cannot now be recognized.

While it thus seems difficult or impossible to understand the significance of the word Zaraath from a medical standpoint, a more reasonable explanation is afforded from the religious point of view as expressed in the conclusion of McEwen[17] that "the word leprosy did not refer ever and always to true leprosy, but was rather a generic term covering various sorts of inflammatory skin diseases, which rendered the one afflicted unfit to associate with others, not because his condition was contagious as a disease, but because by virtue of the belief among the Hebrews in the principle today known as 'taboo,' it disqualified him for the worship of Jehovah, threatened others by contact with a like disqualification, and required ceremonial procedure for removal."

Among the references in the Bible of dermatologic interest may be mentioned the disease with which Job was afflicted. We read in the description that he was smitten by Satan "with sore boils (schechin ra) from the sole of his foot unto his crown," and, furthermore, that "he took him a potsherd to scrape himself withal." It would seem that a diagnosis of boils would hardly be compatible with the pruritus that would cause the patient to sit in the ashes, as we read, and scratch himself with a piece of pottery. From a consideration of the entire narrative, Preuss considers the disease of Job to have been a universal eczema.

An interesting case of hypertrichosis is mentioned in the Bible in the person of Esau, the twin brother of Jacob, who at his birth was "all over like a hairy garment," and of whom Jacob later said "Behold, Esau my brother is a hairy man and I am a smooth man."

The medicine of the ancient Hindoos ranks next to that of the Egyptians, Babylonians and Hebrews in point of antiquity. It is superior to the former, according to Baas,[18] and not far behind Grecian medicine in the extent and elaboration of its doctrines. The oldest and most celebrated treatises on Hindoo medicine that are now extant are the Charaka Sauhita and Susruta Ayurveda. "An older work," writes Dutt,[19] "called Ayurveda is mentioned in both these works as having formed a part of Athar Veda. It is said to have been originally composed by Brahma the Creator and to have consisted of a thousand chapters and a hundred thousand slokas. Afterward in consideration of the short lives and small intellects of human beings it was abridged into eight chapters. The Ayurveda with a hundred thousand slokas is probably a myth, but the Ayurveda with its eight divisions seems to have had a real existence although it is not available at the present day. It probably became obsolete after the works of Charaka and Susruta were composed." The works of Charaka and Susruta are supposed to be commentaries on the Ayurveda, and though written by men, are given divine origin. Thus, it is said that Charaka was prepared by Atreya, who was instructed by Indra the King of Heaven, while Dhanwantaree, the physician to the gods, imparted his knowledge to his pupil Susruta. Charaka is the more ancient work, and is thought by many to have been written about the time of Christ. Susruta was probably of later origin, and is especially noted for its attention to surgery.

The relation of all the ancient systems of medicine to the priestly class is nowhere better shown than in India, where the art of medicine was controlled by Brahmins, although for a time Buddhist priests contested their supremacy in this field. Medicine in ancient India was very highly respected, as may be judged by the saying that one of the fourteen precious objects which their gods are believed to have produced by churning the ocean was a learned physician. While the Brahmins themselves were philosophers and teachers, the actual practitioners of medicine were the Vaidyas or a sub-caste of the powerful and aristocratic Brahmins.

7. McEwen, E. L.: The Leprosy of the Bible in Its Medical Aspect, Biblical World, 1911, xxxviii, No. 3.
8. Fox, G. H.: Biblical and Modern Leprosy, Pop. Sc. Month., 1884, xxiv, 797.
9. Von Bärensprung, F.: Die Hautkrankheiten, Erlangen, 1859, p. 1.
10. Neumann, I.: Lehrbuch der Hautkrankheiten, Vienna, 1880, p. 1.
11. Bloch, I.: Der Ursprung der Syphilis, Part 2, Jena, 1911, p. 486.
12. Preuss, J.: Biblisch-talmudische Medizin, Berlin, 1911, p. 369.
13. Münch, G. N.: Die Zaraath (Lepra) der Hebräischen Bibel, Dermatologische Studien, 1893, xvi, 72.
14. Sack, A.: Was ist die Zaraath (Lepra) der Hebräischen Bibel? Virchows Arch. f. path. Anat., 1896, clxiv, 201.
15. Finaly, S.: Ueber die wahre Bedeutung des Aussatzes in der Bibel, Arch. f. Dermat. u. Syph., 1870, ii, 125.
16. Ebstein, W.: Die Medizin im Alten Testament, Stuttgart, 1901, 89.
17. McEwen, E. L.: The Leprosy of the Bible: Its Religious Aspects, Biblical World, 1911, xxxviii, No. 4.
18. Baas, J. H.: Outlines of the History of Medicine and the Medical Profession, New York, 1889, p. 49.
19. Dutt, U. C.: The Materia Medica of the Hindus compiled from Sanskrit Medical Work, Calcutta, 1877, p. 6.

The teaching of the ancient Hindoos in anatomy and physiology shows that they were not accustomed to dissect the human body or those of animals. In their description of anatomy it is stated that the body contains 500 muscles, though only 490 in women, from 300 to 360 bones, twenty-four nerves and, of special interest to us, that the skin consisted of seven layers or membranes. According to Wise,[20] the skin was supposed to be healthy when it was soft and had much hair.

"Hindu physiology," writes Garrison,[21] "presupposes that the vital processes are actuated by means of the air (below the navel), the bile (between the navel and heart) and the phlegm (above the heart) from which are derived the seven proximal principles chyle, blood, flesh, fat, bone, marrow and semen."

The ancient Hindoo conception of the cause of disease included many natural phenomena, such as exposure, climate, irregularity in food, exercise, etc., which were supposed to corrupt or derange the humors. They also thought that diseases could be caused by sins committed in the present or in a former life. Thus, one who killed a cow might suffer from lepra. A drunkard might be punished by a skin disease, and an incendiary by erysipelas, etc.

While we have seen that Egypt was the land of specialism in medicine often carried to an absurd extreme, the opposite condition prevailed among the ancient Hindoos. As Baas says, "Indian medical practice is distinguished from that of all other people of antiquity by the fact that it recognizes no proper specialties but simply physicians practicing general medicine." Though there were no skin specialists in ancient India, there evidently would have been plenty of occupation for such, had they existed. Many diseases of the skin are mentioned by the ancient Sanskrit writers, and this in spite of the strict regulations that were given concerning personal hygiene and diet. Such regulations involved a daily bath and inunctions with oil, especially about the head, ears and the soles of the feet. Their clothing had to be absolutely clean, as it was said that soiled clothes produced skin diseases. The nails, beard and hair were to be kept clean and cut every fifth day, etc.

Of the many diseases described by the ancient Sanskrit writers, none is of greater interest to the dermatologist than leprosy, especially as the disease is now so prevalent and severe in Asia. The early descriptions of leprosy, as in every country, appear to have included other harmless diseases of the skin. According to Wise, the "Hindoos distinguished three kinds of leprosy, a black, white and red variety and eighteen forms; seven of those are severe in their nature and eleven are mild." One of these spurious varieties is evidently ichthyosis, in which the patient does not perspire and presents large, oblong patches like the scales of a fish, rough like the skin of an elephant and of a dark brown color. Portions of the description, however, point unquestionably to leprosy, such as the hands and feet becoming stiff, insensible, ulcerating and dropping off, the nose falling in, the eyes becoming red, and the voice unnatural and hoarse

In the differential diagnosis of leprosy, the modern physician would certainly excel his ancient Hindoo colleague, though in regard to treatment he would have little to suggest, except as to the benefits of segregation. What better advice could we give than that of the ancient physician who instructed his leprous patient to "bathe, to avoid wine and fatigue and to attend to diet, take a proper degree of exercise and wear clean clothes." Some of their medicines would not be considered so favorably, as, for instance, tumeric powder in cow's urine to be taken every day for one month. The seriousness of leprosy was recognized by the ancient Hindoo physician, who classified it among the seven diseases which had a bad prognosis.

The ancient Hindoo account of elephantiasis is short but unmistakable. To quote from Wise, "It is stated that damp and cold situations produce this disease, that it attacks different parts of the body, and that it is incurable after it has remained upwards of a year, or is very large." We read of "small eruptions appearing upon the face at the time of puberty, produced by phlegm, wind and blood," evidently a description of acne. For dandruff, which is supposed to be due to deranged phlegm and wind, Susruta recommends bleeding, a rather heroic method of treatment. A remedy recommended by Chakradatta for a peculiar itching of the scrotum (possibly eczema) would not be suitable to an acute condition at least. This consists of sulphate of iron, concrete juice of the bile of the cow, sulphate of copper, sulphuret of arsenic and of antimony, to be made up in a paste with acid rice water. For the cure of external worms (pediculosis), fluid mercury is to be rubbed with sulphur until a homogeneous black mass is produced and rubbed over the affected part. Among other cutaneous affections described by the ancient Hindoo writers may be mentioned acne, boils, carbuncles, abscesses, alopecia, canities, erysipelas, urticaria, purpura, nevus, verruca, ulcers, diseases of the nails and chicken pox.

In the very extensive materia medica of the ancient Hindoos there were a good many remedies recommended which appear to us rather grotesque. Thus, it is hard to see any value in using the moisture contained in cow dung for inflammation and discoloration of the skin. On the other hand, the Hindoos deserve credit for having used arsenic not only in leprosy but also in other diseases affecting the skin. Mercury also, according to Royle,[22] appears to have been externally employed in the time of Pliny. Their external remedies included oils, plasters, poultices, baths, hot applications for inducing perspiration, fumigation for ulcers and skin diseases, and the cautery, both actual and potential.

Whatever opinion we may hold in regard to the medical knowledge of the ancient peoples of whom we have spoken, it must be admitted that the real foundations for the scientific study of medicine were laid by that remarkable race, the ancient Greeks, under the leadership of the immortal Hippocrates. Although himself a descendant of a long line of priest-physicians, Hippocrates (460-377 B. C.) was the first to separate medicine from religious superstitions and philosophical sophistries. He said that disease arose from natural causes and not from the anger of the gods. He was a great exponent of the vis medicatrix in advising us to "follow nature," and he recognized that accurate observation was necessary for all medical progress.

20. Wise, T. A.: Review of the History of Medicine, London, 1867, p. 181.

21. Garrison, F. H.: An Introduction to the History of Medicine, Philadelphia and London, 1913, p. 30.

22. Royle, J. F.: An Essay on the Antiquity of Hindoo Medicine, London, 1837, p. 15.

Without much knowledge of anatomy and little or none of physiology, it is hardly surprising that little progress was made by Hippocrates and his followers in ascertaining the essential nature of disease. Like the four elements, earth, air, fire and water, and the four qualities, heat, cold, moisture and dryness, there were supposed to be four cardinal fluids or humors in the body, the yellow bile, blood, mucus and black bile, in the order named. By a uniform mixture and adjustment of all of these, health was maintained. The basis of life was the innate heat, the evaporation of which caused death. The presence of air that was supposed to exist in the vessels was also considered essential to life. In a disease running a normal course, the process went through the stages of "crudity," "coction" and "crisis," the first being a degeneration of the fluids, the second a preparation stage for their removal and the third their actual removal.

In regard to the Hippocratic conception of skin diseases, it is not to be doubted, as Kaposi[23] has said, that certain affections were considered to be independent or idiopathic in their origin. Others were thought to consist of deposits on the skin (apostases) which resulted from certain morbid conditions of the humors within the body. In this sense the Hippocratic writers spoke of a skin disease as an eruption, a breaking out or an efflorescence (exanthema). They looked on many diseases of the skin as curative attempts of nature which should not be disturbed, as otherwise the morbid condition might return inward or be "driven in," to use an expression that is frequently heard at the present day among the laity. While mainly considering skin diseases from the humoral-pathologic standpoint, Hippocrates also discussed the etiologic effect on them of age, sex, climate, seasons and even the weather.

As Rayer[24] says, Hippocrates "enquires into the symptoms of eruptions rather than attempts to describe them." Indeed, from his descriptions, it is difficult for us to judge of the original meaning of the terms, many of which are still in use in our dermatologic nomenclature. The form and color and certain features are often mentioned, but there are no exact descriptions of appearance and locality of skin disease.

In a critical study of the names of skin diseases used by Hippocratic writers, von Bärensprung says that the word "exanthemata" is used to refer without distinction to the "most diverse, acute, and chronic, itchy and non-itchy, dry and moist, flat and vesicular forms of eruption." Under this general conception are included three groups of disease. The first of these are the phymata, to which belong "all boils or tumors that rise upon or under the skin and gradually undergo suppuration." In this class are included furuncles (dothienes and terminthoi). The second group of diseases consists of the dry, scaly eruptions, the lopoi (from lopos the epidermis and lepo to scale). This includes lepra (which was doubtless psoriasis), lichen and pityriasis. A third group of exanthemata helchodea comprised the moist eruptions such as kerion, and achor, the moist eczema occurring in the scalp and face of children and eruptions consisting of vesicles or pustules (phlyctenai).

Attention is also called by von Bärensprung to the broad conception that was intended for the words "herpes" and "psora." Herpes referred to eruptions that gradually crawl or spread from a given point. One variety, herpes esthiomenos, appeared to be synonymous with phagedaina, a term with which we are all familiar. By psora was understood every pruritic eruption, whether dry or moist in character. Among other Greek names that are now in common use for skin diseases may be mentioned erysipelas, gangraina, petechia, ephelide, ecthyma and alopecia.

Among the famous aphorisms of Hippocrates which have been commented on by such a host of writers for the past 2,400 years may be mentioned several of dermatologic interest. Hippocrates says, for instance, "In dropsical persons, ulcers forming on the body are not easily healed," a statement with which all will agree. Again he says, "It is better not to apply any treatment in cases of occult cancer, for if treated the patients die quickly, but if not treated they hold out for a long time." Accepting the view of the ancient commentators that "occult" may mean deep seated, Adams[25] says that the conception of this aphorism will be that when cancer is superficial it can be removed by knife or cautery, but is best left alone when it is deep." In some of the aphorisms the meaning is not very clear, as in the statement that "broad exanthemata are not very itchy," or that "patients who have become bald are not subject to large varices, but should such varices supervene upon persons who are bald, their hair again grows thick."

One of the case histories of Hippocrates that is of interest to the dermatologist was that of a man who had suffered severely from general pruritus and thickening of the skin. Failing to obtain relief he went to the island of Melos where hot baths were to be found. We then read that he was cured of his pruritus and thickening of the skin but unfortunately developed dropsy and died, a statement that illustrates the honesty of Hippocrates, in consequence of which he was spoken of by jealous rivals as a practitioner of the "medicine of death."

If the reputation of the ancient Romans depended on their medical instead of their military and political achievements, we would indeed have a poor opinion of their genius. There was no such thing as a Roman system of medicine, and, indeed, there were comparatively few Roman physicians. The practice of medicine was almost entirely in the hands of the Greeks, who were responsible for all scientific progress and most of the literature. Before the appearance of Greek physicians, the Romans, as Pliny says, had gotten along without physicians for six hundred years, relying on simple remedial herbs, charms, etc. In their superstitious effort to be protected from illness, they worshipped innumerable goddesses of disease, among them being a goddess of scabies.

The physicians of the early Romans were looked on with contempt, and were not even entitled to citizenship until the time of Julius Caesar. The prejudice against them, however, gradually lessened until they were finally accorded unusual privileges. "The honorarium of a physician," writes Baas, "for an ordinary visit amounted to about 29 cents," though Pliny mentions a high priced physician who was paid the equivalent of ten thousand dollars by Manlius Cornutus for relieving him of a skin disease. The medical profession in ancient Rome, it may be added, was

23. Kaposi, M.: Diseases of the Skin, New York, 1883, p. 3.
24. Rayer, P.: Treatise on the Diseases of the Skin, London, 1835, xxxv.
25. Adams, F.: The Genuine Works of Hippocrates, New York, 1886, ii, 256.

not in any way responsible for the splendid achievements in hygiene, such as the building of great aqueducts, sewers and public baths, which were undertaken without their aid or advice.

While the practice of medicine, as has been said, was chiefly carried on by the Greeks, the best account of the art at that time was written by a Roman, Aulus Cornelius Celsus[26] (25 B. C.-50 A. D.). In spite of his masterly descriptions of diseases, it is even doubtful whether Celsus was a physician. He certainly did not engage in practice for a livelihood. In addition to his work on medicine entitled "de re medica" and consisting of eight books, he was the author of treatises on agriculture, philosophy, jurisprudence and history. Though Celsus made no impression on his contemporaries or the medieval writers, his work on medicine was eventually appreciated and is the only part of his writings that has survived.

The work of Celsus is of special interest to the dermatologists on account of the comparative importance given to diseases of the skin. In the fifth book, twenty-eighth chapter, of his "de re medica," a number of diseases are described with considerable accuracy and can be easily identified. They include carbuncle, furuncle, carcinoma, phagedenic ulcer (therioma, corresponding to the herpes esthiomenos of the Greeks), scrofuloderma (phygethlon) abscess, fistula, kerion, warts (achrocordon and myrmecia) and corns. A few other diseases whose identity we can probably recognize were venereal warts (thymia), acne, pustules (phlyzakia), erythema multiforme (epinyktis) and anthrax (from a remark that certain cases of carbuncle are painless.)

The terms "impetigenes" and "papulae" included eczema, while "pustulae" referred not only to what we term pustules but also lesions of urticaria and miliaria. Scabies referred to various forms of eczema, and vitiligo included three affections, alphos, leuce and melas. Of these, alphos might have been guttate psoriasis from the description, which reads, "It is called alphos when it is white; it is commonly a little rough and not continued, but appears like drops dispersed here and there. Sometimes it spreads wider leaving some places between free."

In his sixth book, Celsus describes various conditions of the hair and beard. He recommends frequent shaving for hair that falls after an illness, and adds with great truth that "no remedy whatever can prevent the heads of some people from becoming bald with age." The term "porrigo" was used for ordinary dandruff and probably eczema as well. The latter disease was also apparently included under the name "sycosis." Under the title of "area" is described alopecia areata, often spoken of as area Celsi. He writes that it is "almost folly" to cure freckles, "but it is impossible to prevent women from being nice in what regards their beauty." Other dermatologic affections that are described by Celsus include elephantiasis Graecorum, ulcers and burns, condyloma, varicose veins and gangrene.

Pliny the historian (23-79 A. D.) mentions several diseases that were not included by Celsus, among them being herpes zoster, which was described by Scribonius Largus under the title of Zona. Pliny also speaks of several unusual diseases, among them the cutaneous affection called mentagra, which some have erroneously considered to be syphilis. Caelius Aurelianus wrote about phtheiriasis and elephantiasis; while, according to Bloch,[27] who is our best dermatologic historian, the first accurate description of leprosy was written by Arataeus the Cappedocian (30-90 A. D.).

As the period of ancient history is considered to end with the fall of the Roman Empire in 476 A. D., it would hardly be proper to lengthen this address to include an account of the Byzantine and Arabian writers, who cannot strictly be classed among the ancients. It is sufficient to say that valuable contributions to dermatology were made by the Arabian physicians, especially in their account of leprosy and of elephantiasis. Rhazes (860-932) was the first to accurately describe smallpox and measles. Avicenna and Haly Abbas wrote careful descriptions of diseases of the scalp, and Avenzoar is said to have discovered the parasitic cause of scabies.

In conclusion, I hope that I have shown that the study of the history of ancient medicine is not altogether a thankless or uninteresting task. I can merely add that I not only appreciate the honor of my position as chairman but also the opportunity it has afforded me for dermatologic studies of fascinating interest.

26. Celsus, A. C.: Medicine in Eight Books, Trans. by Grive, London, 1838.

27. Bloch, I.: Aufgaben und Ziele einer Geschichte der Hautkrankheiten im Altertum, Monatsh. f. prakt. Dermat., 1898, xxvii, 605.

TRANSVALUATIONS *

NORVAL H. PIERCE, M.D.
CHICAGO

A kindly French philosopher has said that it is better to be 50 than 40 years of age, for 40 is the old age of youth, while 50 is the youth of old age. Having reached this venerable juvenility in life's journey and having passed more than half of these years in the active practice of the special branch of medicine to which this section devotes itself, your chairman feels himself in a position to scrutinize, in the light of experience, certain otolaryngologic tendencies.

If we charted human endeavor as we do our fevers, we would find that the curve displayed by progress resembles in a way that characteristic of sepsis which ends in recovery—first a high elevation, followed by a recession to below normal and then a return to the norm. Medical progress, being only a part of the whole, has displayed no exception to this rule. The introduction of a valuable innovation has been followed by an enthusiastic exaggeration of its value. Then, depressed by disappointment, its value is underrated. In the end, however, sober judgment prevails and its true value is established. The phase of overestimation, underestimation and "return to soberness" following the introduction of tuberculin and salvarsan to the medical profession may be cited as examples of the flow and ebb of medical opinion. These phases vary as to the time required in transition. In the case of tuberculin, the first period, the period of exaggerated hope, was quite short in duration, followed by a rather long period of underestimation; while in the case of salvarsan, the first and second periods were much shorter. But our observation leads us to the conclusion that not only the newer innovations are subject to these remissions of enthusiasm, but also even the oldest and most time honored are subject to

* Chairman's address, read before the Section on Laryngology, Otology and Rhinology, at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

the same law. Take, for example, tympanic inflation, a procedure the value of which is still apparently greatly overestimated in the minds of many of my confrères. Not wishing to be misunderstood as being ignorant of this very valuable aid in the treatment of properly selected cases, I will state my position in relation to its value.

The middle ear may be regarded as a modified pulmonary alveolus, modified to the extent that it contains the sound-conducting mechanism of the organ of hearing, but retaining its ancient power of absorbing oxygen and giving off carbonic acid gas. Any obstruction to the admission of air through the eustachian tube will, therefore, cause a diminished gas pressure in the tympanic cavity. The atmospheric pressure in the external auditory canal will press the tympanic membrane inward to just the degree that the pressure in cavum is diminished by absorption, thus more or less dislocating the ossicular chain and diminishing its conductivity for sound waves. The conducting apparatus under normal conditions is held in such marvelous equilibrium that it transmits sound waves that transcend the power of the finest microscopic measurements. According to the amount of displacement of these various factors in this transmitting apparatus, various degrees of hardness of hearing result. If, by inflation, we can restore the ossicular chain to its normal position, immediate and marked improvement in hearing occurs, and we may infallibly judge the degree of mobility by the resulting improvement in hearing. There comes a stage, however, when inflation is absolutely ineffectual because of adhesions, ankylosis, dislocations, etc., and yet, I have known innumerable instances in which men have continued to perform this medical ceremony for months at a time, without any benefit to the patient—thus bringing discredit on themselves eventually and inviting the transmission of that discredit to otology as a whole. Let us admit at once that inflation has a very limited field of usefulness. In acute cases to prevent adhesions after the acute inflammatory process has subsided; in subacute cases to restore equilibrium while we remove the cause of tubal obstruction; to remove secretions from the tube and middle ear when perforation of the tympanic membrane has occurred—these are the principal indications for inflation. But if we are amazed at the men who endeavor to mobilize in cases of middle ear deafness when the malleus and incus are permanently fixed, what are we to think of the colossal faith of those who continue to indulge their fetish in cases of otospongiosis when the stapes is fixed in the fenestra by bony ankylosis, or when the hardness of hearing is due to dissemination of the spongifying process elsewhere in the labyrinth, or in cases of nerve degeneration. Is it faith that permits them to go so far astray, or is it ignorance of diagnostic methods?

Another correlated subject, and one of great importance, is the etiologic relationship of the nose to diseases of the ear. Far be it from me to underrate the frequency with which acute inflammations of the ear find their origin in diseases of the nose, but more frequently in the pharynx, or the influence certain chronic conditions have in perpetuating inflammatory tubal insufficiency. Nevertheless, I am convinced that the importance of the nose in relation to diseases of the ear is grossly exaggerated in the minds of many specialists. I agree with Felix Semon that:

> Even in cases of complete obstruction of both nostrils by multiple polypi, ear complications of any kind have been extremely rare in my practice. And if further evidence were needed, it is afforded by the fact that even in cases of complete bilateral congenital occlusion of the choanae by bony or membranous diaphragms, perfect hearing power and absence of any aural symptoms have been observed by others as well as by myself. You will understand, then, that I profess myself to be rather skeptical concerning the asserted great influence of nasal stenosis without concomitant chronic catarrh upon all possible ear trouble.

I do not hesitate to say that the slight variations from the normal in the septum and turbinated bodies which are so frequently seen and nearly as frequently operated on have no bearing whatsoever on ear diseases. After permanent changes have taken place in the ear, such as adhesion and ankyloses, it is futile to correct even marked abnormalities in the nose in the hope of exerting beneficial influence on the aural condition. Notwithstanding this, it is to my knowledge a not infrequent occurrence for patients to be promised restoration of hearing after the performance of such operation—again discrediting the practitioner and bringing discredit on otology.

Indeed, the accusation that there has existed among practitioners in our specialty a certain lust for operating is not without foundation. The patients come to us to have something done while we, on our part, are always on the lookout to find disease. As Dr. Goodheart remarks:

> There are times when the sick are not reasonable beings and unless they have a bottle of medicine to anchor their faith to they are in a state of unrest that is positively harmful to their progress.

And, as Semon says in commenting on this:

> This is certainly true. And, further, when with a little experience to guide one, one sees that the patient, disappointed at not getting what he wants, thinks: "That doctor does not understand my complaint," and that he is sure to fall into the hands of the topical enthusiast, or of somebody worse, who will be equally sure to mulct him in a perfectly unnecessary operation. One is confronted by the difficult question whether in the patient's own interest it would not have been better to comply with his wish and to give him something local which, if absolutely useless, would have been at any rate harmless, and would have set his mind at rest. I dare not say that this "pia fraus" must never be practiced. But against it are three very grave reasons, which I would particularly recommend to your consideration. In the first place, when prescribing some local application, which, of course, has to be repeated at stated intervals, you involuntarily become the patient's accomplice by concentrating his mind on his local sensations, whilst in his own interest you ought by all possible means to divert it from them. Secondly, you lend yourself to supporting the general notion, which you know is neither correct nor desirable, namely, that all affections of the upper air passages ought to be treated locally. And thirdly, and most serious of all, by yielding to the temptation you may unconsciously, and with the best intentions in the world, yet very actually, transgress the line between legitimate practice and quackery. Under all circumstances, therefore, the pious deception of which I have just spoken ought to be practiced only in the rarest of cases, and the doctor ought to stiffen his back and harden his heart against meekly complying with every unreasonable wish expressed by an unreasonable patient. Better, I think, to lose such a one if he will not listen to well-meant advice than to confess to yourself that you have descended to the level of habitually acting against your own better conviction.

When I began the study of this specialty it was little more than a matter of sprays and spurs, of

snares and syringes. Now, we are firmly emplaced on a broad surgical basis. No longer do we confine ourselves to intralaryngeal, intranasal or intra-aural operations, but by most radical external surgical procedures we aim to cure the most extensive disease of the nose and accessory sinuses, the larynx and pharynx, the ear and neighboring parts within the cranial cavity. This change has taken place gradually. It took years of endeavor to set the bounds of laryngoscopy, rhinoscopy and otoscopy. But latterly, by the work of Killian, Jensen and many of our own Fellows, the advance has been more rapid, so that at the present time the well-rounded and successful specialist not only must possess that special skill and dexterity which enable him to successfully examine the larynx, the nose, with the orifices of the several accessory sinuses, the ear, both by otoscopy and by means of the complex functional tests, but also he must combine with this a broad surgical knowledge equal to that of the general surgeon, and an ever-accessible knowledge of regional anatomy superior thereto.

Thus have we clearly proved our right to exist as specialists and members of the surgical department of the great science and art of medicine.

But may I express a fear that the pendulum may swing too far in the direction toward radicalism? With the technic of the external operation firmly in our grasp, are we not liable to resort to them prematurely—to forget the much that may be done by more conservative local measures? Let us not cease to cultivate to its highest development that special manipulative dexterity in the local examination and treatment of the nose, throat and ear which has made men like MacKenzie, Stoerk, Chiari, Politzer and many others, among our own members, famous, and which is followed in suitable cases by the most brilliant results.

For instance, when I hear a colleague say that he puts every laryngeal case on the table and examines the larynx by means of Killian's suspension apparatus, I am convinced that his zeal has outrun his discretion. I would make a plea to you that in our enthusiasm over direct laryngoscopy we do not abandon the cultivation of skill in the employment of indirect laryngoscopy. Nearly as much can be accomplished by the latter as the former and with not nearly so much discomfort to the patient.

The same may be said as regards operative procedures. Without constant practice in this regard, with indirect laryngoscopy that virtuosity which made the old masters so wonderfully skilful in the removal of growths in the larynx may be lost to the profession; and this, to my mind, is something to be avoided.

In conclusion, I wish to voice a fear that too much faith has been engendered by the enthusiastic members of our profession in the use of serum and vaccine in the treatment of nose, throat and ear affections. My personal experience has been most disappointing. I cannot recall one case of chronic aural trouble, in which the presence of bone affection was proved, that was influenced in any way by the administration of serum or vaccine. The same may be said in relation to diseases of the accessory sinuses. We must be careful to avoid that isolated position which was prophesied for our specialty some years ago. There are signs that this prophesy is reaching somewhat of a fulfilment. The remedy for this is a close affiliation with medicine as a whole. There is nothing so deplorable as the specialist who has lost sight of the rest of the organism and sees nothing but the special domain in which he is engaged. Advancement takes place, as I said in the beginning, in phases. Let us try to avoid overenthusiasm and zeal; let us endeavor to cultivate an unceasing sobriety with a large field of vision in our administrations to the sufferers who come to us for relief.

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INTESTINAL OBSTRUCTION

A PROTEOSE INTOXICATION *

G. H. WHIPPLE, M.D.
SAN FRANCISCO

The poison under discussion may be obtained from the fluid above an intestinal obstruction, from a closed washed loop of small intestine or from the mucosa of a closed loop or a loop draining externally through an enterostomy wound. The intoxication which develops with intestinal obstruction or after producing a closed or drained intestinal loop is very similar, differing only in intensity. In like manner one can inject this poison into a dog and produce more or less profound intoxication, depending on the amount of poison introduced. This intoxication resembles closely that observed following intestinal obstruction. The evidence is overwhelming that an active poison is concerned in the production of the clinical picture of intestinal obstruction and of the closed intestinal loops.

The poison is found in rather concentrated form within the lumina of the closed loops of the small intestine. Dogs can be immunized by sublethal doses and can then withstand lethal doses of this poison, but the immunity cannot be carried very high. Moreover, these immune dogs can survive intestinal obstruction or closed loops much longer than controls. This immunity is associated with a developing capacity of the organ cells of the body to destroy this toxic substance. Filtered immune organ extracts, presumably containing active enzymes, can destroy this poison in vitro, but the blood of immune animals contains no such enzymes and is inactive toward the poison.

If a loop of small intestine is washed out thoroughly, its ends closed and the continuity of the intestine established around it by means of a gastro-enterostomy or entero-enterostomy, any intoxication which may ensue must be due to one of two things: (1) bacterial activity; (2) perverted activity of the loop mucosa (or both factors in conjunction).

We have been able to show conclusively that the intestinal mucosa is essential to the production of this poison because with destruction of the mucosa by means of sodium fluorid the formation of the poison ceases. Whether bacterial activity is essential to the production of this poison is less certain, but no conclusive evidence that bacteria are essential has been

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* From the George Williams Hooper Foundation for Medical Research. This work was begun in Baltimore with the cooperation of Drs. Stone and Bernheim and continued in San Francisco with the assistance of Drs. Cooke and Rodenbaugh. The detailed experiments will be published in the near future.

brought forward. It is certain that bacteria alone cannot form this poison.

Absorption of this poison from the intestine raises a very interesting and perplexing point. When it is noted that the poisonous substance is most abundant and easily demonstrated in the lumina of closed loops, one's first thought is that absorption must be mainly from the lumen, but this is not so. Some absorption may take place from the contents of the loop, particularly if the mucosa is damaged or inflamed, but fatal intoxication will usually result from a loop draining externally and washed daily. Moreover, the introduction of large amounts of poison into a loop will not alter the course of the intoxication and such animals show no more intoxication than controls with loops washed and left empty at the operation. The poison is not absorbed from the normal intestine. All evidence indicates that the absorption of the poison in intestinal obstruction or in closed loops will take place mainly from the mucosa regardless of the material in the lumen of the gut. Our attention should center on the mucous membrane which forms this poison and passes it into the blood stream. This pernicious activity may be carried on to a fatal termination by a mucosa which may be to the naked eye as well as the microscope quite normal except for capillary engorgement.

The *chemical nature* of this poison is of great interest, because once known it will be possible to concentrate attention on the action of similar poisons and finally uncover the best method of the body defense and cure. It is a very elusive substance and necessarily concealed in a mass of confusing materials. Many workers have hazarded guesses about this poison but it has never been isolated in anything like purity or identified. Almost all of the conflicting statements about this poison can be easily explained when it is realized that it is a primary proteose. We have been able to show that it is thrown out of a solution rich in albumins by boiling (adsorption) but that after autolysis or digestion it may be boiled without harm. Its proteose nature explains why the poison is held back in fine earthen filters, as stated by other observers, but not held back by paper filtration. The poison is not destroyed by digestion with pancreatin or fresh pancreas for a period of one week. It is not destroyed by autolysis with intestinal mucosa for a space of weeks but may be completely destroyed in months. Its reaction after intravenous injection in dogs closely simulates anaphylactic shock in these animals, but the poison cannot sensitize guinea-pigs for the characteristic anaphylactic phenomena.

Alcohol precipitates this poison and this is a most important step in the separation of this substance from the mass of extraneous material in the intestinal loop fluid. Five volumes of 95 per cent. alcohol will precipitate completely all of this poison, whether the fluid is freshly removed from an intestinal loop rich in albumins or has been digested to a clear broth. The alcoholic filtrate has been tested repeatedly and contains not a trace of the poison, but does contain the substance which produces the short initial fall in blood pressure (the "tissue extract" reaction). The alcoholic precipitate contains all of the poison. This precipitate may be extracted with ether for days without removing any of the poison and the ether extract gives no reaction when given intravenously in dogs. Water will remove all of the poison from the alcoholic precipitate and the poison goes into solution very rapidly. The residue may be filtered off, giving a clear opalescent solution. This of course contains some albumin, which may be removed in great measure by boiling in faintly acid reaction, and filtration. The resultant filtrate contains the poison, as shown by repeated experiments.

The poison may be still further purified by precipitation at room temperature with equal parts of a saturated solution of ammonium sulphate. This gives a delicate precipitate which may be collected by centrifugalization, dried between filter paper, again dissolved in water and boiled with a drop of acetic acid to remove the last trace of albumin. This gives a solution almost water clear but slightly opalescent. Dialysis of this pure solution against normal salt will remove the most of the ammonium sulphate but will not change the toxic action of the poison, which does not dialyze in the least. This pure solution gives biuret precipitates with phosphotungstic acid or saturation with sodium chlorid. Estimations of dry weight show that 100 mg. of this pure poison is sufficient, if given intravenously; to poison fatally a 15-pound dog.

This process of chemical isolation gives a *primary proteose* and eliminates practically all other substances except sodium chlorid and a trace of ammonium sulphate. Because of the fact that this proteose resists digestion it may be classed as a heteroproteose. The symptoms of proteose intoxication are identical with those of poisoning by loop fluid, and sublethal doses of other proteoses will immunize against this poison and prolong the life of dogs with closed intestinal loops, beyond the controls. The anatomic picture is the same in fatal proteose intoxication and in poisoning with loop fluid. We may assume with certainty that the intoxication of intestinal obstruction and closed intestinal loops is due in great measure to the absorption of a primary proteose from the intestinal mucosa.

It has been shown by Chittenden and Mendel that proteose injected into the blood may be excreted with some rapidity in the urine. We have not been able to detect this substance in the urine perhaps because of the small amount which is fatally toxic and because the flow of urine is inhibited after a large dose. The proteose may be changed in some manner before it is eliminated. Dogs with a trace of albumin in the urine usually show some proteose by Hammarsten's method and this introduces a confusing factor.

It is obvious that diuresis will help in the elimination of this toxic proteose and this explains the beneficial effect of salt infusions in intestinal obstruction. This brings up another point of some interest and of considerable importance from the standpoint of diagnosis.

The injection of this toxic proteose causes a great rise in the incoagulable nitrogen of the blood, which shows a curve rising with the intensity of the intoxication from a normal 30 mg. to 70 or 80 mg. shortly before death, and this change may take place in acute poisoning within a space of three hours.

Dogs with intestinal obstruction may show an incoagulable nitrogen as high as 200 mg. and about the same is true of the closed-loop dogs. The rise in incoagulable nitrogen of the blood seems to depend on the intensity and rapidity of the intoxication and is of considerable prognostic and diagnostic value.

Tilleston has reported two observations on human cases with very high incoagulable nitrogen of the blood in intestinal obstruction.

In conclusion it is to be emphasized that the intoxication of intestinal obstruction and closed intestinal loops is due to the absorption from the intestinal mucosa of a *primary proteose*. This proteose intoxication may be associated with a rise in the incoagulable nitrogen of the blood to four or even ten times normal. This fact may be of value in diagnosis and prognosis.

University of California.

ABSTRACT OF DISCUSSION

DR. VICTOR C. VAUGHAN, Ann Arbor: Would a loop in one part of the intestine furnish the same poison as a loop in another part? Did 100 mg. kill the dog, and how was it administered? Intravenously?

DR. G. H. WHIPPLE, San Francisco: Yes.

DR. VAUGHAN: Did Dr. Whipple make a biuret test? Is there any blood coagulation after death; any coagula found? Does it resemble beta-iminazolylethylamin in its poisonous action? Can you get an immunity by injecting small doses? I understand that boiling does not destroy it; therefore it cannot be a ferment, like the extract from the lungs, nor the ordinary extract from the epithelium of the duodenum.

DR. FRED T. MURPHY, St. Louis: In working on this problem for several years, first in the laboratory of the Harvard Medical School with Dr. Vincent, and later at Washington University Medical School, St. Louis, with Dr. Brooks, in preparation of the papers of which Dr. Whipple spoke, we thought that we had proved that this poison found in occluded loops was not a specific secretion of the mucous membrane and was not produced without the action of bacteria. The experiments which we considered as conclusive were as follows: After drainage for a long period we obtained a loop of intestine in which the content remained sterile. When obstructed no symptoms were caused and the content of the loop was not toxic. After infection had been introduced, symptoms were produced and the content became toxic. Gallbladders in which a circulatory disturbance had been caused by ligation of the cystic duct and vessels caused no acute symptoms, and the content remained nontoxic so long as bacteria were not introduced into the gallbladder; but when the content was infected by cultures from the intestinal tract, acute symptoms were produced identical with those in intestinal obstruction, and the content on injection showed the same toxicity as the content of an obstructed loop of intestine. Having these gallbladder experiments in mind, I wish to ask if in attempting to determine the specificity of this toxin any hollow organs other than the intestine had been used. In a rather cursory attempt to isolate a definite toxin from these obstructed loops, we were much impressed by the similarity between the toxin which we obtained and that which Faust described years ago in his study of the ptomains. We were unable to get anything as specific as Dr. Whipple has, and he is to be congratulated on his results.

DR. G. H. WHIPPLE, San Francisco: This pure substance gives a very beautiful biuret test. I may say, too, that this substance is thrown down by complete saturation with sodium chlorid. It has been thoroughly established that closed loops of the lower part of the intestine are very much less toxic than high closed loops. We do not know the reason. That is one of the difficult things to solve, which we may be able to get at by studying the activity of the mucosa. Loops of the large bowel in dogs give such slight intoxication that one can almost disregard it. The animal will live for months, and if the animal is sacrificed the large intestinal loop will be found to be filled with material that looks exactly like normal feces. The different parts of the intestinal tract have different activities as regards the production of this poison. We have attempted to get the most concentrated poison, and for that reason have used the duodenum with a part of the jejunum, varying in different experiments.

The reaction in the blood following the injection of this poison is very characteristic. There is a definite amount of antithrombin produced, as with the injection of Witte's peptone. The blood is not always incoagulable. It is notorious that the introduction of various amounts of peptone will give different amounts of antithrombin. Sometimes one may get absolute incoagulability of the blood, again only slight antithrombin production. Beta-iminazolylethylamin of Dale, mentioned by Dr. Vaughan, is alcohol soluble and nonprecipitable by ammonium sulphate; also the substance sepsine mentioned by Dr. Murphy and investigated by Faust. All ptomains are alcohol soluble, and I believe the initial treatment with five ounces of alcohol excludes all such substances. Immunity can be produced to a slight degree only. I have never been able to immunize an animal to more than a double lethal dose, and the immunity disappears shortly after production—I mean in a matter of weeks. Immunity, as we have shown already, resides in the activity of tissue cells; it is not in the blood. The immune organs can destroy this poison, or rather, extracts of those immune organs can destroy this poison in vitro. Boiling does not injure the substance. When it is boiled in a fluid containing albumin it is taken down by adsorption.

Dr. Murphy raised the point about occluded gallbladders infected by bacteria. We have never tried any such experiment, but it is quite conceivable that the action of bacteria on the injured mucosa of the gallbladder may produce toxic proteoses. I should think it would be extremely interesting to see whether that toxic substance produced in such gallbladders is a proteose or some other substance.

PROGNOSIS IN HEART DISEASE

FROM THE POINT OF VIEW OF ETIOLOGY *

W. H. WITT, M.D.

NASHVILLE, TENN.

The tendency to a more scientific classification of diseases of the heart—using so far as possible the etiology as a basis — is decidedly to be welcomed. And it is a source of congratulation to us that certain of our own physicians, notably Dr. Cabot, have taken the lead in this work. This more rational classification will work for good in every phase of our study of cardiac conditions, but it is particularly to the matter of prognosis that I wish to call attention.

Prognosis in heart cases has been discussed from many angles, as, the valve involved—if it be a valvular lesion — the physical signs of decompensation, symptoms, changes in blood pressure, age of the patient, his habits, etc.; but there is also excellent ground for a discussion of prognosis in a general way, taking into account the causes of the disease process and how that process may be modified by treatment. For I use the word "prognosis" not in its narrower meaning of forecasting the ultimate issue, but in a broader sense that includes a knowledge or attempted knowledge of the processes at work and their susceptibility of modification by therapeutics of whatever sort. It is recognized that any of the causes that operate to produce heart disease may bring about similar lesions that give similar symptoms and physical signs, but these symptoms and signs will have different meaning depending on the underlying cause. And the value of appreciating the underlying cause no one will deny. An aortic insufficiency from rheu-

* Read before the Section on Practice of Medicine at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

matic endocarditis is a different thing from that of syphilis or arteriosclerosis—and a mitral regurgitation of rheumatic origin is different from that following dilatation of the left ventricle. Both prognosis and treatment are modified by these differences.

From the standpoint of etiology the great majority of patients that suffer from cardiac disease come under the following classification: Simple endocarditis and its resulting changes, chiefly valvular, syphilitic, nephritic and arteriosclerotic, which may be syphilitic or of renal association, or without either of these attendant conditions. There is a goodly number of other situations in which the heart comes in very justly for consideration but in which other pathology overshadows that organ in our minds at least. In this class I would put the hearts in septic endocarditis, hyperthyroidism, adherent pericardium, and other conditions, including pulmonary and bronchial disease. The first, septic endocarditis, is not essentially a heart disease and the patient does not die a cardiac death. The others have features that do not admit them to the right to be discussed here.

Heart disease in children and young adults has, in most cases, a relatively simple etiology in that the great majority arise from what we call rheumatic infection. And we so speak of them whether or not the joint symptoms are present, bearing in mind that clinically or experimentally there is ground for associating arthritis, tonsillitis, endocarditis and pericarditis, chorea and even additional lesions. We recognize of course a lack of finality in our teaching along bacterial lines, but we are no doubt justified in recognizing a close etiologic kinship in these lesions and, further, in holding to the reasonableness of speaking of simple or benign endocarditis.

There are, of course, less benign cases, even serious cases, not to be distinguished etiologically from the usual ones, as there are cases of endocarditis from other causes, as scarlet fever, diphtheria, gonorrhea; but even then we can say with Osler that "All other causes sink into insignificance before the endocarditis-producing poison of this motley (rheumatic) group." This group probably comprises nearly half, though it has not been so in my own experience, of patients who come to us because of cardiac symptoms or accidentally found cardiac defects. The prognosis in these cases assumes great importance and I am glad to say the picture is not nearly so dark as many have thought.

There stand out two main facts in the behavior of acute simple endocarditis. The first is that in the very great majority of first attacks the patients recover not only from the illness but with fairly capable hearts. The second fact, and one of immense importance, is that there will probably be a recurrence. The younger the patient the greater the liability of recurrences, the greater also the liability that the infection may be masked and unnoticed by reason of the absence of troublesome joint symptoms. In the first attack, then, the prognosis is good—not so good, of course, if pericarditis is present or probably if chorea is present. The danger, however, lies largely in recurrences: it lies to a less extent in the slow sclerotic process that may attack the crippled valve and gradually interfere with its function or produce similar changes in the orifice which it protects.

It is chiefly the children that have recurrences, and the deaths that I have seen in endocarditis of young people have all occurred, not from chronic development of heart difficulties, but in a recurrence in which were exhibited almost all the features of an acute attack with probably pneumonia or pleurisy added. In adults gradual decompensation without fresh infection is commoner, as there is also greater danger that patients of this age may develop a septic type on what has been a simple type and die weeks or months—in one instance under observation recently, fifteen months—after reinfection. Avoidance of reinfection, then, becomes of great importance; in fact in children it is almost the whole thing. How far this can be done can only be ascertained after extended clinical experience. Long before a bacterial cause of rheumatic fever was accepted the association of that disease with sore throat was well recognized. The stimulation given the subject in the last few years has shown almost as definite a relation of sore throat to the cases of endocarditis that have no arthritic signs. While other foci of infection, the teeth, for instance, may have a clinical relation to endocarditis, as yet the tonsils are thought to hold chief place. The rôle of adenoids we do not so well know. Anyhow, removal of tonsils and adenoids, I think, constitutes our best means of avoiding recurrence in endocarditis. Most patients will recover from the first attack with a rather good heart even if there is a persistent murmur: but whether good or somewhat crippled, with pallor and shortness of breath on exertion, they are proper subjects for surgery. For I cannot believe that there is as much danger in an anesthetic as there is in a recurrence. Not that a cripple will be whole after surgery, but he will have a better life expectancy.

Physicians have been keen enough to insist on the removal of foci to prevent arthritis, but they have not had the same boldness in the presence of evidences of valvular crippling. Also it is hardly realized that it is of more importance to prevent a recurrence of rheumatic fever in the young with a view to saving the heart than to saving the joints. A great deal will depend on the confidence the family doctor has in such measures and the boldness with which he urges them. It might be thought that this advice is superfluous, that it is being constantly acted on. I hardly think so. There is still on the part of many physicians too much dread of a murmur. Some good authorities seem timid. Dr. Poynton, who has done so much good work on rheumatism, writing in Osler's Modern Medicine, last edition, says: "With chronic tonsillar disease the desirability of complete removal should be considered." But this is too weak and does not sufficiently safeguard the child. In contrast with this, however, I quote the following from Hirschfelder:

> The patients almost always recover from the first attack (of endocarditis): Recurrence is especially common and is the danger against which precaution must be taken—the more so as the second attack often spreads to another valve or even to two more. . . . When the patient is still subject to recurrence of his rheumatism or tonsillitis . . . the probability that the cardiac lesion will remain quiescent is a small one.

The surgery must of course be thorough surgery.

The prognosis of syphilis of the heart is being worked out anew. That syphilis has a tendency to attack arteries, the coronary as well as the aorta and the aortic valves, has long been known and a proper valuation has been put on disease of at least some of these tissues. Until recently it has been accepted that

these changes occurred almost entirely in the later stages of the disease. The work of more recent years has brought forcibly home to us the fact that syphilis may and often does attack the heart in the secondary stage with rash and mucous membrane lesions, and that these lesions grow largely out of changes in the ramifications of the coronary arteries, thus reaching the heart muscle itself. True gumma is still regarded as rare, but no less real changes occur in various portions of the organ. Grossman stated that in some 40 per cent. of cases of secondary syphilis some heart disturbance was shown.

Brooks of New York, and his associates, have done much in their writings to develop interest in this field and seem to have made out a case of neglect on the part of physicians in general, in that they seem to have proved that early cardiac syphilis is common and that it is almost as commonly overlooked. At necropsy and by therapeutic test they have demonstrated the presence of specific lesions. It is not claimed that there are definite symptoms of cardiac syphilis that serve to distinguish it from trouble arising from other causes, but there are cases of cardiac symptoms and physical signs, especially arrhythmias and precordial pains arising, often early, in the course of syphilis—that cannot be accounted for readily on the more common ground for such symptoms and that have cleared up completely on specific medication. These writers and others believe that cardiac syphilis is much more common than is generally suspected and urge a more careful history taking and serologic examination in suggestive cases.

What are suggestive cases? If we see a patient at or under middle life developing heart difficulties we are accustomed to inquire carefully into rheumatic history, and other infections, such as influenza, are included, but we are not so careful to unearth a history of syphilis, especially if the difficulties do not seem associated with the aorta or aortic valves. Failing to get a history of rheumatic infection in some of its manifestations, whether or not nephritis be excluded, syphilis looms up as our best guess as a cause of infection; and with due respect for the proprieties, its existence or nonexistence should be at once established.

It is trite to say that a patient's statement as to rheumatism is never to be taken. The proper questions must be put to ascertain whether he has had what may properly be called rheumatic fever or its equivalent. This for the general practitioner or consultant who sees the case as a heart case. More satisfactory discovery of these luetic cardiopaths must come by way of special watchfulness on the part of the specialist in venereal diseases and the great bulk of general practitioners who treat this disease. It is common enough to have the syphilitic strip at certain intervals and have his skin and mucous membranes and lymph glands examined with great care but it is just as common to forget to examine the heart or to inquire into slight evidences of cardiac involvement. Etiologic diagnosis, then, not anatomic diagnosis, is the great desideratum. Etiologic treatment, also, not simply cardiac treatment, is the thing. Now it is probably fair to say that the prognosis in this form of heart disease is going to be in exact relation to the time at which the trouble is recognized. If known early and properly treated, clinical experience so far as reported seems to bear out the reasonable view that many cases can be completely cured. The later cases, as has so long been known in the aneurysmal and similar cases, cannot be relieved, though no doubt we modify what would be their natural evolution.

I do not think cardiac lesions, recognizable ones at least, will have as good prognosis as many other visceral changes of syphilis. The ease with which this incidence is overlooked, the delicate and important nature of the anatomic structures involved, with the development of irreparable damage before treatment is established, impair what one might think a favorable prognosis. But it is not too much to hope that the increased interest in this subject, coupled with the great enthusiasm in the treatment of syphilis engendered by modern discoveries, will materially lessen the arterial and other circulatory troubles of middle and later life. These lesions, however, when once established, belong in the class of essentially progressive, degenerative changes, and the prognosis partakes of the character naturally attaching to that class.

THE ARTERIOSCLEROTIC GROUP

To establish the fact that a heart is laboring under degenerative changes that grow directly out of arteriosclerosis is not always easy. There are certain infecting agents—such as syphilis or influenza—that may attack the heart in people of advanced years. At the same time we are usually satisfied with such etiology if we have age, gradual onset of symptoms, of which precordial pain is important, and evidences of vascular changes in other parts of the body. The pressure is often, but not always, high. If we can satisfy ourselves of the presence of myocardial changes due to arterial changes in its walls, how do we reason for a prognosis? In the presence of such pathology we are confronted with a clinical course varying from that of endocarditis of rheumatic origin, in that the tissue change is essentially a progressive affair. The conditions that predispose to arterial change will for the most part persist. Age, mental strain, bodily strain, imprudent eating, high pressure, continue to operate to the hurt of our vascular systems. These factors may be further supplemented by alcohol and syphilis. With the possible exception of the syphilitic attack, changes in blood vessels must be regarded as permanent and as a result nutritional deficiency is permanent.

It is quite true that some of the factors leading to arteriosclerosis can be abated, such as mental and physical strain, or overeating. But even these things are two-edged swords. Not every man profits by giving up business and leading the so-called quiet life. He often chafes under his restraints, and frets, or he may become too idle for his own good, or he may eat too much. I feel quite sure the stress of modern life, combined with hasty and liberal feeding, is a real factor in the apparent increase of heart cases. In the very great majority of instances there is established high pressure, vascular change and cardiac phenomena before we know anything of the case and then it is too late. Even if the doctor happens to pick up some shreds of information, as in life insurance examinations, the patient is not likely to heed his warnings. We are committed to our time and do not relish existence in Cathay.

We have no drug that can relieve, as in syphilis, the pathologic changes in these hearts. There is no recur-

rence of infection to head off as in endocarditis. I do not doubt that a kind of healing is possible after some acute changes that follow severe strain or a dilatation or a thrombosis, so that the immediate symptoms induced by the accident may greatly clear up, but they are rather sure to come again and the most that we can do is so to order life as to minimize the chance for this recurrence. If evidences of breakdown occur in pursuit of one's ordinary duties, to which one is accustomed and at which one must remain, the prognosis takes on a more serious aspect than if symptoms occur under unusual circumstances. A farmer of 66 years of age passed through a strenuous session of the legislature, losing sleep and enduring considerable mental strain. He all but broke down —with precordial distress and shortness of breath. Returning to the bucolic life and living in the way to which he had been accustomed, he comes now, four years later, feeling quite well and not short of breath.

Every such individual has the elements of a breakdown and only needs unusual strain to produce it. If he pursues his ordinary pursuits his prognosis is good. I rather feel that the prognosis is least good in those persons who have led more or less uneventful lives, with little mental or physical strain. If such persons develop myocardial symptoms, there is little that they can do to improve on their usual mode of life. There is this proviso, however, that in a limited group of persons, particularly if these troubles develop say before 55, a more active life in the open with less heavy diet may actually develop greater cardiac capacity.

The Schott treatment is suitable for a rather fair-sized group of cardiopaths of middle age. I think it is rather difficult to make selections, but I should be guided largely by the age, the absence of precordial pain, the nature of the previous life, and habits of eating and drinking. In the presence of anginoid pains I think such treatment had best be taken cautiously. In many cardiopaths of middle age and just above it is not unlikely that we overestimate the proportion of change effected by vascular disease. It occurs to me that quite a few may owe their distress to a flabby heart, as other muscles are flabby, coupled with a sluggish peripheral circulation. The high blood pressure necessitated to flush the capillaries puts a strain on a heart not educated to do hard work and gradual failure occurs. A change of mode of life to one of more active type may restore circulatory power and greatly improve the prognosis.

Eliminating the probability of actually improving the condition of the circulatory apparatus our prognosis in these cases comes to rest very largely on symptoms and the ease of their production. In many respects pain becomes an excellent prognostic symptom. We are accustomed to attach great importance to so-called true angina, but I am not sure that slight precordial pain, if easily produced, is not just as serious as the more severe attacks. I have seen some cases of severe angina drift along for several years and I have seen some slight precordial pain go out suddenly after only a few attacks. The ease with which shortness of breath is produced, the associated pathology, as of the lung, the presence of edema and many other features, affect the prognosis but have no bearing on this type of heart case essentially different from that in the other types.

The height of the blood pressure with or without renal change has a bearing on prognosis. However much we may regard high pressure as in a sense a physiologic condition, we are compelled to assume that the heart is doing more work than it can hope to keep up indefinitely. While work begets hypertrophy and increases capacity, yet in the presence of any coronary disease or probably without it—failures must come earlier than in a heart that is not called on to drive so strongly. If pulse pressure is high the danger of failure with dilatation is greater. A high pressure that cannot be brought to a lower stage by nondrugging measures carries with it a bad prognosis; not for the immediate future, probably, but life expectancy is impaired.

When the heart trouble is complicated by chronic interstitial nephritis the prognosis is no doubt affected by that circumstance, but to what extent it is difficult to say, there is such a wide variation in the behavior. Indeed, there is wide difference of opinion as to what constitutes interstitial nephritis. The anemia of that disease, the toxemia, whatever the nature, the accompanying arterial change, all probably have their bearing on the evolution of the cardiac features, but clinical observation would suggest that they must operate with very varying degrees of activity in different cases. Some certainly go to pieces rapidly; others, and not a few, have considerable lease of life.

The types of nephritis associated with edema often develop cardiac elements and the prognosis of a heart case of this association is bad. The edema, probably cardiac as well as general, increasing as it does the work the heart has to do and impairing its power to do it, the toxins of the nephritis, often very active, do not often admit of any great improvement and as a usual thing the end is not far off.

In the matter, then, of favorably influencing the prognosis in these types of cardiac failure the profession has in sight very little encouragement. It is rather their incidence that must be affected by preventive measures, but what those measures are to be is largely a matter for evolution.

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ABSTRACT OF DISCUSSION

DR. C. S. WILLIAMSON, Chicago: Dr. Witt stated that the prognosis of heart lesions depended first on the etiologic relations and much less on anatomic considerations. I should like to add that functional considerations are as important as the etiologic relations. In an article in THE JOURNAL this year, I hold it is impossible to find in a general way the functional capacity of the heart. We are familiar with the high blood pressure of renal diseases, but the cases in which it is probably most difficult to give a scientific prognosis are those in which we have a murmur when we are not certain whether it is so-called accidental, anemic, or due to organic change. I tried measuring the heart by a particular Roentgen method. With a normal individual at a distance of 7 feet, 1 inch, with the breath held, taking a picture in systole and diastole, then subjecting the patient to stair-climbing, to the extent of about eighteen or twenty thousand foot-pounds of work, I found the normal heart contracts definitely and cleanly. That has been asserted and denied first by the Schott and Nauheim school and later by others. I found the normal heart gives a clean-cut contraction of about 1 cm. Then in low grade stenoses insufficiencies, cases of definite heart lesion, I subjected the patients to exercise to the extent of their powers, and I found that about one-half of them showed a definite contraction, the other half showing some dilatation of perhaps a few millimeters. In severely damaged hearts, patients with edema and enlargement of the liver, we

found that after exercise about one-half of them still showed a contraction, and that I think is a new observation. The point bearing on the delightful paper of Dr. Witt is that we can add a certain modicum to our prognosis if the patient is capable of exercise, by taking the roentgenogram before and after. If the heart contracts down clean and squarely, a centimeter or a centimeter and a half, you may be sure the heart is comparatively sound. A leakage that contracts down well is better in prognosis than a heart of obscure lesion that does not so contract. There are many things to be considered in the prognosis of disease of the heart, but the only little thing I can add is the possibility of determining the reserve force of the heart in the manner I have indicated.

DR. JAMES S. MCLESTER, Birmingham, Ala.: I have in the last two years acquired great respect for syphilis as a cause of myocardial disease. In the Hillman Hospital a surprisingly large number of our patients with heart disease give a positive Wassermann reaction. I have been particularly impressed with this in those patients presenting the syndrome which we commonly know as chronic parenchymatous nephritis. All of these show myocardial disease and nearly all give the serum reaction of syphilis.

DR. JOHN A. WITHERSPOON, Nashville: As to endocardial troubles from focal lesions, not only the tonsil is responsible for many of these acute cases, but alveolar abscesses are particularly liable to cause them. It is not safe to rely either on the appearance of the gum or the diagnosis of the dentist. Repeatedly I have sent patients to dentists and they would report the gums perfectly normal. Roentgen-ray pictures of such cases frequently revealed an abscess at the root of one or more of the teeth; possibly the entire root separated from the alveolar chamber. On removal of the affected teeth immediate improvement occurs. It does not matter how badly the heart is acting, the only thing to do is to remove the focal infection. I do not think we are ever justified in permitting the cause to remain. In the Nauheim treatment, it is the system used, associated with the baths. The diet and the regulation of the habits of the patient permit of the contraction of the heart. It is ridiculous for us to attempt to measure the heart by auscultation and percussion, when it can be done accurately only by the use of the Roentgen ray.

DR. GEORGE E. EBRIGHT, San Francisco: I should like to confine my remarks to acute endocarditis in children. It is true, as Dr. Witt suggests, many patients probably recover from the first attack. There are several reasons for that assumption. One is that in adults chronic endocarditis is frequently found without a history of a definite previous endocarditis. Undoubtedly many cases of acute endocarditis in children are overlooked. It is necessary in the treatment of such cases that the child should remain in bed for a sufficient length of time not only for the active endocardial inflammation to subside, but also for a sufficient length of time to allow for the subsidence of the myocardial irritability which persists longer than the active inflammation. Broadbent has suggested as the usual minimum three months, and from that to eight months or even longer; otherwise avoidable dilatation and consequent hypertrophy will ensure, resulting in later years in a cardiac cripple. It should certainly be assumed that where a primary focus of inflammation is found such as diseased tonsils or teeth, the eradication of the tonsils or the proper treatment of the dental infection is imperative, but it may not be possible to demonstrate such a focus, or the initial inflammation may be entirely healed and the endocarditis easily still continue.

DR. W. H. WITT, Nashville: In the individual case the modes of testing the capacity of the heart are quite important. In reference to syphilis of the heart, as I intimated, it is a subject that has not been worked up as it should be, although it has received considerable study in certain quarters. I live in the South where we have a great many negroes with untreated syphilis, and while it has been known that aortitis and aneurysm are frequent in the negro, the incidence of cardiac syphilis in these untreated patients has not been so well worked out. We have set to work to determine the frequency of these conditions in untreated syphilis. In reference to treating children for endocarditis, we have been practically dependent on the advices particularly of the English physicians, along the line of prolonged rest, to give time for recovery of cardiac tone. It is only in a limited number of families that such directions will be carried out. We should try to get rid of the focus of disease, which is much more important. It is much safer to remove the focus of infection than to take the chances of no recurrence and of the patient's being good to himself and not overdoing the capacity of his heart. Focal infection as the cause of cardiac lesions is undoubtedly important in old people, but so many factors are present in older people that it is difficult to determine in many cases where the focus is. But when we can detect a focal lesion, it should be removed.

CONCERNING END-RESULTS OF GALLBLADDER AND DUCT DISEASES*

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The late Dr. Maurice H. Richardson[1] said: "Diseases of the biliary tract from diagnosis to established convalescence are attended by responsibilities of human fallibility of the highest order." It was he also who said that no two cases of biliary tract lesions will be exactly alike, and as compared with lesions of the appendix the possibilities are infinite. It is the evident difficulty of telling from the beginning the end-results of gallbladder and duct disease which has led us to a review of our cases. This review includes all the cases occurring in our private and hospital practice during the past twenty years in which a diagnosis of some lesion of the gallbladder and ducts was made. This period is happily coincident with the time when diseases of this part of the anatomy have first begun to be considered from a surgical standpoint. The report, therefore, includes both operative and nonoperative cases, of whatever pathology, which may have been found at operation or necropsy or which may have been diagnosed clinically as having a pathologic entity. It must be admitted from the outset that we cannot speak definitely of a diagnosis unless the case has come to operation or necropsy. In fact, we might suggest that even an operation does not always reveal the whole or underlying pathology. It is for this reason that the subject of this paper is made so indefinite, so far as the accepted and classical nomenclature of the pathology of the biliary tract is concerned. The report is to comprehend all cases having some lesion of the biliary tract, 193 cases with operation and 407 without operation. Every effort has been made by direct communication, correspondence and in other ways to keep ourselves informed of the conditions of those patients still living, and of the determining cause in those who succumbed soon after the operation, or of those in whom death occurred some time after the operation. It is to be regretted that our diagnosis in some cases could not be any more definite, and that the end-results cannot be reported more completely.

* Read before the Section on Practice of Medicine at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

1. Richardson, Maurice H.: Remarks Upon the Diagnosis and Treatment of the Biliary Tract with Especial Reference to the Difficulties and Dangers, St. Paul Med. Jour., February, 1912.

We feel justified, however, notwithstanding these discrepancies, to present this compilation, for it may add to our knowledge of the comparative frequency of gallbladder and duct diseases as found clinically, may furnish an opportunity for emphasizing the necessity of more definite application of well-known and accepted curative measures, and it will enable us in a way to make a comparison between the results of the so-called medical treatment and of the surgical treatment. Many other points of interest appear in this compilation, such as sex, age, the relation of gallbladder and duct disease to pancreatic disease; the frequency of previous infections, especially of typhoid fever; the frequency of an associate glycosuria; the effect, if any, of diseases of the biliary tract on gastric function, the frequency of malignancy, etc. The number of cases observed by us are, of course, too few to justify our drawing any conclusions as to these interesting points. We must be satisfied by merely calling attention to their incidence in our experience.

Inasmuch as most of our gallbladder and duct cases were diagnosed cholelithiasis, it might be well to refer to the incidence of gallstone as found in large compilations taken from necropsy reports. Hesse[2] studied the postmortem material of a large hospital in St. Petersburg and among 17,402 necropsies done in ten years, found 378, or 2.17 per cent., of gallstone cases. From nineteen European and American pathologic reports, including 80,802 necropsies, he found 4,848, or about 6 per cent., of gallstone cases. The proportion of males to females was one to seven. The most frequent age, that is, at the time of coming to necropsy, was from 60 to 70 years, and of those 4,848 necropsies revealing gallstones, in only 16 per cent. were there any symptoms referable to gallstones. The old saying, "dead men tell no tales," can justly be applicable here, for it has been no unusual experience with us in cases when operations were instituted for other conditions and gallstones unexpectedly found, to get a good and satisfactory subsequent history of previous gallstone symptoms. If the patient had succumbed and no subsequent history could have been obtained, it would readily confirm misleading statistics which are advanced to prove that gallstone patients are in a great percentage of instances without symptoms. While we are not satisfied with the popular symptom complex of "fair, fat and forty with flatulence," we find in our experience, especially in so far as history taking is concerned, that gallbladder trouble and especially gallstone disease, can be diagnosed not infrequently without the cardinal classical textbook symptoms and signs.

Of the 614 cases of gallbladder and duct diseases tabulated, 193, or 31 per cent., of patients were operated on and 421 were not operated on. These 614 cases occurred among 3,487 cases diagnosed as having some pathology, or at least some decided functional disturbance of the digestive system, and in which no other diagnosis seemed satisfactory. And they occurred among 14,000 patients as they appeared in private hospital and consulting practice. From these figures it will be seen that about 4.3 per cent. of cases of all kinds presented gallbladder and duct diseases, and that these comprised about 17.2 per cent. of all patients having diseases of the digestive system. Two hundred and fifty-one were males and 363 were females. Of the gallstone cases, 163 patients were males and 283 were females, while of the cancer cases three were males and eight were females.

Of the 193 patients operated on 137 had gallstones and two had gallstones, besides being malignant. Fifty-four had a cholecystitis or a chronic angiocholitis. Of the 137 gallstone patients operated on, 83 were cured, 13 were relieved, 8 experienced no benefit, 11 died within a month from the operation, 8 died later, and from 14 we have not received any report recently. Of the 11 who died within a month from the operation, 6 were common duct cases and 5 were simple gallbladder cases. The fact that more than half of the fatal cases were common duct cases is significant. One of these had had gallstone symptoms for twenty years, another for fourteen years, two for six years and two for five years. The extent of the pathology found at the operation seemed in direct proportion to the duration of the disease. Of the eight patients who died later than one month, four died from causes other than gallstones. Four patients, on account of recurring attacks, were operated on more than one time.

Of the 54 patients having cholangitis, and who were operated on, 22 were cured, 10 were relieved, 13 received no benefit, 2 died within a month after operation, 2 died several years after the operation from other causes, and 5 could not be traced. This class of cases gave the most unsatisfactory results, largely, we think, because of the divergent pathology found. Some were cases of simple chronic cholecystitis, others were cases of cholangitis showing the various types, catarrhal, suppurating and gangrenous, while still others showed a pericholecystitis. The majority were associated with other pathology, more or less grave, which determined the results. Of the two cancer patients who were operated on, one was of the ampulla and the other of the fundus. These two, as well as the nine malignant gallbladder cases in which operation was not performed, died in due time.

TABLE 1.—GALLBLADDER AND DUCT CASES—OPERATIVE

	No.	Male	Female	Cured	Relieved	No Benefit	Died Within 1 Month	Died Later	No Report
Cholelithiasis, common duct	16	34	103	83	13	8	6	1	14
Gallbladder	121						5	7	
Cholangitis	54	25	29	22	10	13	2	2	5
Cancer	2	0	2	0	0	0	0	2	0
Total	193	59	134	105	23	21	13	12	19

In explanation of our mortality, we must call attention to the fact that these patients were operated on by twenty-four different surgeons, under varying circumstances and conditions. They were not selected cases. We do not recall that any patient was refused operation by the surgeon unless it was to wait until jaundice had cleared to an extent, or to await the subsiding of an accompanying acute inflammatory condition. On the other hand, it is needless to say that many patients for whom operation was agreed on as the advisable procedure, refused operation, preferring to follow medical treatment or seek other advice. Otherwise, our list of operated cases would be much larger. In this respect the treatment of gallbladder and duct diseases differs widely from that of diseases

2. Hesse, E. R.: Frequency of Gallstones, Russk. Vratch, 1914, xiii, No. 9, p. 289.

of the appendix. In acute appendicitis the physician frequently can justly assume the attitude of a "hold-up man": "Be operated on now or you may lose your life"; and on account of the stress of circumstances and the absolute confidence exhibited by the physician, the patient almost invariably consents to the operation.

In gallbladder and duct diseases, on the other hand, when the patient is in greatest pain and is most willing to do anything to avoid a recurrence, he must be told by the physician, and by the surgeon if he is called, that the time is not opportune for operation until the attack is over and the acute inflammation and jaundice, if they are present, have subsided, when an operation will be advisable and necessary. Not infrequently after the attack there is such a feeling of well being that no amount of pressure will convince the patient that an operation must be done to prevent future complications. This is one explanation for the large proportion of unoperated cases in this report. It must be admitted, therefore, that the internist is probably in a better position to speak of the end-results in gallbladder and duct diseases than the surgeon. The surgeon sees usually only the operated cases, whereas the internist meets and must stay with or follow the large number of patients in whom the severity and complications of the disease prevent an operation.

In presenting the 421 unoperated cases in this report we do so with a keen appreciation of the difficulty of making a definitely reliable diagnosis, a fact to which we have already referred in the introduction to this paper. But we feel that a diagnosis of a lesion of the gallbladder or ducts is not much more difficult than the diagnosis of acute appendicitis, and probably not nearly so difficult as the diagnosis of chronic gastric or duodenal ulcer. Both of these diagnoses are frequently accepted without question before operation or necropsy. We will not enter into a description of the routine diagnostic methods which we employ. In some patients we recovered gallstones from the stools; in some jaundice was present, and many we saw in repeated attacks and observed for long periods. Of the cases comprising this group, 309 were diagnosed as possible gallstone, 103 as possible cholecystitis and 9 had cancer. In referring to our results, we will not

TABLE 2.—GALLBLADDER AND DUCT CASES—NOT OPERATED

	No.	Male	Female	Relieved	No Benefit	Died	No Treatment or No Report
Cholelithiasis	309	129	180	114	47	13	238
Cholecystitis	103	60	43				
Cancer	9	2	6	0	0	9	0
Total	421	192	229	.....	....	22	

consider any patient as cured, though some have passed gallstones and have not had any attacks since, and many report themselves "perfectly well." One hundred and fourteen are relieved, 47 declare they are no better, 13 died and 238 either were not treated or could not be followed. The thirteen patients who died were not under our observation at the time, but from what we could learn five died from other causes than gallbladder and duct disease.

The group represented in Table 2 were called "not operated," largely to avoid the term "medical cases." They are properly, with few exceptions, all surgical cases. Since, however, it is difficult to interest a surgeon in a patient who will not or does not come to operation, the internist or the family physician must institute a care of the patient's diet and mode of life as well as a line of symptomatic medical treatment which will afford as much comfort as possible under the existing circumstances. This line of treatment, which was rarely the same in two cases, frequently led to a remarkable amelioration of symptoms. It is not our purpose at this time to present this part of the subject.

In making this compilation of cases many interesting points have appeared aside from those included under the subject of the paper.

TABLE 3.—AGE INCIDENCE IN GALLSTONES

Age at Operation	No. of Cases	Sex	Per Cent.	Duration Average, Years	Average Age at Onset	Age at Onset	Average Age at Operation
20 to 29....	11	F 9 M 2	18	5	22	Under 40	
30 to 39....	31	F 28 M 3	10	6	29	57%	
40 to 49....	37	F 27 M 10	27	6	39	....	45
50 to 59....	27	F 19 M 8	30	6	48	Over 40	
Over 60....	16	F 8 M 8	50	15	49	43%	
All cases...	122	F 91 M 31	25	6¾ 7½	36 42	....	F 43 M 50

1. The Average Age of Gallstone Patients at Onset and at Operation.—For the women the average age of onset was 36 years, and the average age at operation 43; while for men the average age was 42 at onset and 50 at operation. Most of the cases occurred between the ages of 40 and 50. The average time of existence of symptoms before operation is seven years.

2. The History of Acute Infections.—It is generally thought that a history of typhoid fever would suggest gallstones. Of the 122 cases of gallstone disease, only twenty-one patients gave a history of typhoid, and of the fifty-four cases of cholecystitis, twenty patients gave a history of typhoid. Other infections were not tabulated.

3. Glycosuria.—In the literature attention has frequently been called to the relation of gallbladder and duct disease, as well as gallstone disease, to pancreatic disease. The epoch-making work of Opie is well known. In our 614 cases we found only six patients, or 1 per cent., having glycosuria. One of these patients developed glycosuria about five years after a successful operation for gallstone associated with empyema of the gallbladder. She continued having sugar, though there were no gallstone symptoms, for three years, when she died from an accident. In reviewing our records of patients having diabetes mellitis, we find 150 cases among about 14,000 patients. In our experience, therefore, the incidence of glycosuria in gallbladder and duct diseases as compared with the incidence of glycosuria in all diseases, is only about one-tenth per cent. higher.

4. Gastric Secretion.—In June, 1910, one of us (Lichty[3]) read a paper before the American Gastro-Enterological Association on the relation of gallbladder disease to gastric function. It was attempted in this paper to show by experiments on dogs and also from the clinical material then at our command, that gallstones are usually associated with a hyperchlorhydria. We are gratified to report that our clinical experience still confirms the opinion held at that time. Of eighty-two gallstone cases in which operation was performed, in which gastric analyses were made, 73 per cent. had hyperchlorhydria, and of thirty-six cases of cholecystitis in which operation was performed, in which gastric analyses were made, 70 per cent. had a hyperchlorhydria.

CONCLUSIONS

1. From the fact that only five of the 121 patients having stones in the gallbladder operated on died, and as many as six out of sixteen having stones in the common duct died, it seems evident that early operation, before the case becomes a common duct one, is by far the safest procedure.

2. From the fact that only thirteen of 174 unoperated patients whom we have followed died, it seems evident that the nonoperative or so-called "medical treatment" has a mortality scarcely any higher than the operative.

3. From facts which are not shown in the tables, but which have frequently been observed by us, reduction of mortality should not be the sole consideration in treating these patients. Many of the nonoperated patients, on account of their extreme suffering during the attacks, and on account of anxiety and their limited diet between attacks, are leading a miserable and almost useless existence. Many are drug habitués.

4. Patients having disease of the gallbladder and ducts present great difficulties from the standpoint of conducting an accepted rational and scientific treatment. This is no doubt due to the protean character and periodicity of the symptoms, and to the peculiar traditions and attractive quackery which constantly appeal to them.

ABSTRACT OF DISCUSSION

DR. J. N. HALL, Denver: Dr. Lichty's figures, as he states, would indicate nearly as high a death rate in the patients treated surgically as medically, but emphasis should be laid on the fact that those cured surgically nearly all stay cured, while the alleged medical cures have the possibilities of trouble still with them. As in the case of the appendix, a medical recovery means ordinarily merely a remission. As in the case of the appendix again, the mortality is practically all from the complications of the disease rather than from the original illness. In the present series the mortality from the common duct stones was nearly ten times that of the cystic calculi. In a series of cases seen and operated under the earliest and most favorable conditions, a mortality of 1 per cent. is probably attainable, and without such favoring conditions, 2 per cent. has already been reported in very extensive series. Yet Hans Kehr, perhaps the greatest of the German operators, has reported a mortality of 10 to 15 per cent. in large groups of operations. It is remarkable that he should criticize American surgeons for operating too early and yet admit their low mortality rates. We have seen the appendix patient so convinced by his own observations among his friends that he comes and asks to be operated, and we may hope for a more favorable attitude on the part of the gallstone victim. Otherwise we shall still have many patients invalided with morphinism, myocarditis, stricture of the duct, septic complications, and especially cancer. It should be noted that in any large series the latter affection alone is found in approximately 3 per cent. of the cases, which exceeds a normal operative mortality in selected cases.

DR. MAX EINHORN, New York: I am also in favor of early operation in the gallbladder cases, but I do not think operation is necessary in all cases. The clinician cannot recommend operation at once in all early cases. But if attacks are frequently repeated or are very severe, then surgery is called for. In regard to medical treatment, I have found glycerin given internally has a beneficial effect on the secretory function of the liver. We can demonstrate that the duodenal contents and bile of individuals who take glycerin will not decompose for two or three days, whereas without glycerin they become putrid in two or three hours. So that as a therapeutic measure we may give glycerin in teaspoonful doses in the treatment of these cases.

DR. JOHN A. MCGARRY, Los Angeles: Dr. Lichty reported only a small percentage of his gallbladder cases in which typhoid fever was an etiologic factor. We formerly believed typhoid fever to be a very important factor in the causation of gallbladder disease. I would like to ask what other special factors he found in its etiology.

DR. J. A. LICHTY, Pittsburgh: I was rather surprised by my statistics. I live in a neighborhood where formerly we had many cases of typhoid annually, whereas now we have very little. I was expecting, therefore, to find that many gallbladder cases would prove to be of patients who had had typhoid fever, but such was not the case. I have no opinion to state at all as to etiology, except that possibly long-continued digestive disturbance, hyperchlorhydria or ulcer of the stomach or duodenum may cause changes which lead to disease of the gallbladder and ducts. As to treatment, this is not included under one subject. We of course could not stand idly by and let these patients go without care, so we have done all we could with dietetic and medical treatment, and it is surprising the results we could report in some cases, and also how decidedly medical treatment often fails. I was glad to hear of Dr. Einhorn's treatment with glycerin, but I hope it will not become known among the laity, for I recall the unfortunate results of such general knowledge in the case of the olive oil treatment and the many patients it led to delay proper treatment. I am fearful that the glycerin treatment will prove much like the olive oil treatment. I agree with Dr. Einhorn that you cannot at once say to the patient that an operation is necessary, but it does seem to me that in cases in which the symptoms speak definitely of some pathology, the operative treatment is the only rational treatment of these cases.

3. Lichty, J. A.: The Relation of Diseases of the Gallbladder and Biliary Ducts to the Gastric Function, Am. Jour. Med. Sc., January, 1911.

April Health Report.—During the month of April there were 34,125 employees in the Canal Zone. The total admissions to hospitals and quarters was 802, a rate of 282.02 per 1,000 as compared with 312.82 for March and 350.59 for the corresponding month of April, 1914. The total number of deaths was eight. Five died from disease or 1.76 per 1,000, as compared with 4.91 for the preceding month and 5.53 for the corresponding month of last year. The constant noneffective rate was 9.85. The total admission rate for malaria was 28.48 compared with 46.99 for the previous month and the total noneffective rate was 0.95 compared with 1.11 for the preceding month. Diseases next to malaria causing the highest admission rate were diseases of the digestive system, venereal diseases, disease of the skin and cellular tissue and of the respiratory system. The typhoid admission rate was 0.35 as against none for the previous month, and 2.01 for the corresponding month of the previous year. It will be seen that the health conditions were good in the Canal Zone, the admission and mortality rates being on the average lower even than usual.

FASCIAL TUBULIZATION IN THE REPAIR OF NERVE DEFECTS *

EDWIN G. KIRK, M.D.
AND
DEAN LEWIS, M.D.
CHICAGO

It is difficult to determine the value of the different methods which have been employed to promote reconstruction of defects in nerves caused by accident, or to restore their continuity after resection because of painful scars, malignant growth, etc. The clinical reports are often meager and in many instances the patients have not been traced long enough to permit of any definite conclusions concerning the ultimate result. The results frequently admit of more than one interpretation. In many of the cases reported sensation and motion have not been carefully tested and often, in estimating final results, account has not been taken of the fact that sensation, and even motion, may be present, at least to some extent, in the area supplied by the nerve which has been divided or resected.

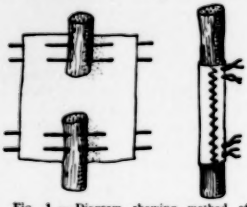

Fig. 1.—Diagram showing method of construction of fascial tube.

Vanlair[1] (1882) first suggested that defects in nerves might be repaired, if a pathway were provided, along which the axis cylinders developing from the proximal stump might pass to invade the distal part of the nerve. A number of different materials, silk protective, fresh and hardened blood vessels of the same or different species, epidermis, magnesium and hardened gelatin tubes have been used in clinical and experimental work for this purpose. That none of these is highly satisfactory is indicated by the few clinical cases in which any one has been used and by the lack of uniformity in the results obtained.

Huber,[2] after careful experimental work, came to the following conclusions concerning the bridging of nerve defects:

1. It is possible to restore functional activity to the peripheral part of a divided nerve with loss of substance, if the resected ends are united by a segment taken from some other nerve trunk, by a catgut bridge, bone drain or tubular suture.

2. The most favorable results are obtained after implantation of nerve segment, the two ends of which have been sutured with one or several catgut sutures to the resected ends of the injured nerve.

3. Regeneration of the peripheral end is the result of the outgrowth of new axis cylinders from the undegenerated axis cylinders of the proximal stump, the budding axis cylinders following the paths of least resistance to reach the peripheral part of the resected nerve.

4. That degenerated fibers of an implanted nerve segment offer much more favorable mechanical conditions to the downgrowing axis cylinders than does the loose connective tissue which supplants the catgut sutures, when this type of bridging is attempted or the bone drain, is shown by the fact that the new nerve fibers have a much straighter course and more regular arrangement in the tissue uniting the resected ends than in the case in which the latter procedures are employed.

Fig. 2.—Section of regenerated segment (within fascial tube) 1.5 cm. below level of plane of proximal section, four weeks after operation (from photomicrograph × 60).

Kilvington[3] (1908), in reviewing the literature, found that the results of homoplastic nerve transplantation were uncertain. Sherren[4] cites one success in six cases and collected twenty cases, six of which could be regarded as successful. He found record of but two cases of autoplastic nerve transplantation, one of which was successful. Kilvington experimented with free nerve transplantation and obtained poor results with heterotransplants; fair with homotransplants, and good with autotransplants. With autotransplants he obtained what he considered functionally perfect results in five out of seven cases. The gross appearance of the nerve when removed was good and there were few adhesions. In one case he bridged a gap of 2 inches in the sciatic nerve. After one hundred days there was complete recovery of sensation and motion. The value of Kilvington's work is somewhat impaired by the criteria adopted by him regarding successful results, namely, the gross appearance of the regenerated

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

* From the Department of Experimental Surgery, Morris Institute of Medical Research of Michael Reese Hospital.

1. Vanlair: De la néurotisation du cartilage osseux dans la suture tubulaire des nerfs, Arch. de Physiol., 1882.

2. Huber, G. C.: A Study of the Operative Treatment for Loss of Nerve Substance in Peripheral Nerves, Jour. Morphol., 1895, xi, 630.

3. Kilvington: Brit. Med. Jour., 1908, p. 1414.

4. Sherren: Edinburgh Med. Jour., September, 1906.

segment, the functional recovery of the muscles and the reaction to electrical stimulation. The inadequacy of these criteria will be discussed later. Microscopic examinations were made of but four cases. Kilvington believed that the axons of the free transplant survived and assumed function. This position is untenable in the light of recent and past neurologic research, as it has been conclusively demonstrated that the axis cylinders degenerate in a free transplant and that the sheaths merely form conduits through which the newly formed axis cylinders can pass.

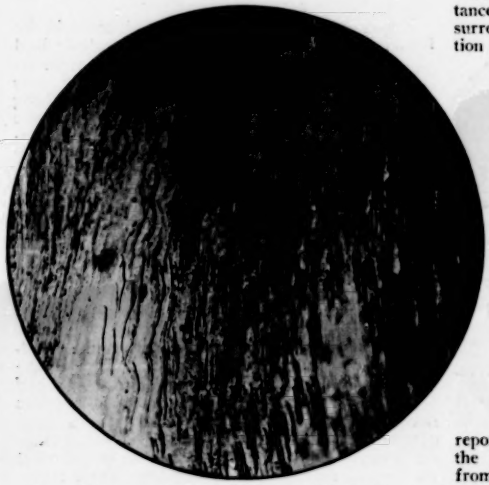

Fig. 3.—Distal segment four weeks after operation, showing invasion of regenerated axis cylinders, some of which are arranged in bundles (× 130).

The best results in transplantation are obtained by tissue removed from the same individual. Nerves and blood vessels frequently cannot be sacrificed to bridge defects in nerves. A tube formed of fascia, providing it did not collapse and undergo secondary cicatricial contraction would be ideal, for the supply is unlimited; a tube of any size can be fashioned to be applied to the nerve in question; and fascia when appropriate conditions are provided contracts no adhesions and remains viable.

TECHNIC OF OPERATION

After the sciatic nerve of the dog is exposed and the section removed, a piece of fascia lata of approximately the required size is removed. No muscle fiber is included. The smooth shiny surface of the fascia lying next to the muscle becomes the inner side of the tube. Some fat usually remains attached to the outer surface. In some cases the loose areolar tissue covering the fascia on the muscle side was scraped off. This seemed to favor contraction and was discontinued in the later experiments. The method of formation and fixation of the tube is indicated in Figure 1. In some experiments the nerve was exposed, cut, and the ends crushed. After two weeks or more the nerve was again exposed, the ends recovered and freshened, after which the fascial tube was applied.

Several points are deemed to be of especial importance in the technic. All trauma to nerve, fascia and surrounding tissue must be avoided. A sharp dissection should be made and hemostasis should be as perfect as possible. The suture must be applied loosely so as not to strangle any part of the nerve. Hemorrhage from the ends of the nerve must be controlled, for blood within the tube will prevent the axis cylinders passing downward. The tubes in cases in which hemorrhage occurred into them were almost occluded by scar tissue. To prevent blood passing from the surrounding tissues into the tube both end-sutures are so tied as to approximate the fascia snugly to the nerve. The tube should have a large lumen to guard against secondary contraction if this occurs. The lumen should be twice the size of the nerve end.

We have performed the operation of tubulization on the sciatic nerve of forty dogs. Ten of these are still living at periods varying from seven days to nineteen weeks after the operation. Two were discarded because of local infection and death from pneumonia. Seven specimens have not yet been studied histologically. This report is based on the study of twenty-two specimens, the animals having been killed at periods varying from one day to sixteen and one-half weeks after the operation. Most previous work on nerve regeneration has been conducted on young dogs. We have used dogs of all ages. Casts were used on the first five dogs, but not on any of the remaining.

Fig. 4.—Proximal segment just above level of proximal plane of section six weeks after operation (× 325). Note enormous increase of nonmedullated axis cylinders. A few medullated fibers are seen surrounded by several nonmedullated axis cylinders (newly formed), situated under and applied to the neurilemma sheath.

The histologic technic was the following: Immediately after death the nerves were excised, stretched on

glass tubing, carefully orientated and fixed. In general two methods were employed in studying the changes, the most important being the Cajal silver method as modified by Ranson. Other pieces of the nerves were fixed with liquor formaldehydi and Zenker, and stained by Malory's phosphotungstic hematoxylin method. Hematoxylin and eosin were also employed.

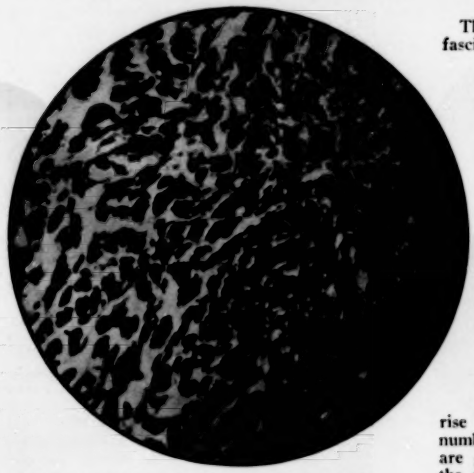

Fig. 5.—Regenerated segment six weeks after operation (× 325). Great numbers of nonmedullated axis cylinders arranged in orderly bundles are shown.

CRITERIA AS TO SUCCESS OF BRIDGING

Several criteria indicative of successful bridging have been suggested. Recovery of function, which will occur only after months when resection is made at a distance, cannot be relied on, especially when the experimental animal is a dog and the operation is performed on the sciatic nerve, for fair function returns about as soon as the postoperative tenderness is gone. The rapid return of function is probably dependent on anatomic peculiarities of innervation in the dog. Improvement in the foot drop is probably indicative of successful bridging, but as the axis cylinders have such a distance to travel, a negative result in the earlier weeks does not mean that the defect has not been successfully bridged. We have seen the foot drop disappear completely in one dog after fifteen weeks and in another dog after twenty weeks. The reaction to electric stimulation cannot always be depended on in estimating the amount of repair, for as Forsmann[5] has shown, irradiation of the current may occur, leading to contraction of muscle even when repair is not complete. The best criteria of regeneration are the gross appearance and the histologic findings.

All the specimens which we have removed have been carefully examined microscopically, after fixation, and staining methods have been employed to differentiate axis cylinders.

5. Forsmann: Zur Kenntniss des Neurotropismus, Beitr. z. path. Anat., 1900, xxvii, 407.

GROSS AND MICROSCOPIC CHANGES OBSERVED AFTER TUBULIZATION

The most interesting changes are observed in the fascial tube. At the fifth day the tube is partially filled with a soft, grayish white pulpy material resembling somewhat in appearance soft gray brain matter. No blood is found, providing hemostasis has been good, an essential to nerve regeneration through a fascial tube. Microscopically this pulpy material is finely granular and homogeneous, evidently coagulated lymph containing a few mononuclear leukocytes. The middle of the tube, that portion most remote from the divided ends, is empty. The microscopic changes in the proximal and distal stumps correspond to those described by Ranson and others in their studies dealing with nerve regeneration, and will be given but brief consideration, except in relation to the bridging of the defect.

In the eight and eleven-day stages the proliferative changes in the proximal stump of the resected nerve are marked. About one half of the medullated axis cylinders have given rise by division and lateral branching to a large number of nonmedullated axis cylinders. These are grouped in bundles of twenty or thirty about the original medullated axis cylinder. These regenerative changes involve the terminal 0.5 cm. of the proximal stump. The newly formed nonmedullated axis cylinders penetrate a little way into the pulpy material which fills the proximal end of the tube. In specimens examined after two and three weeks a solid downgrowth from the proximal stump has invaded the pulpy material. The axis cylinders develop

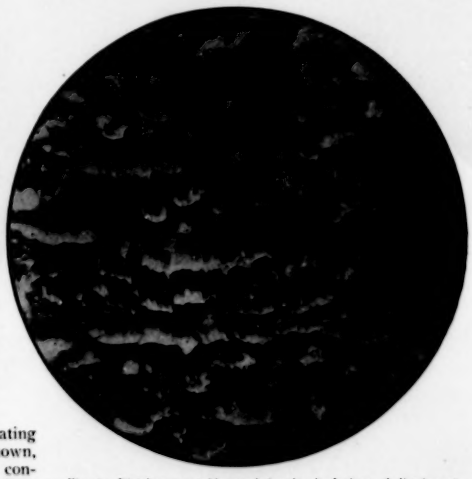

Fig. 6.—Distal segment 11 mm. below level of plane of distal section six weeks after operation (× 200). Shows regenerated axis cylinders arranged in bundles, also remnants of degenerating medullated fibers.

first and most rapidly along the side of the tube, and the nerve end, originally cut transversely, has become oblique. The axis cylinders at this stage have pene-

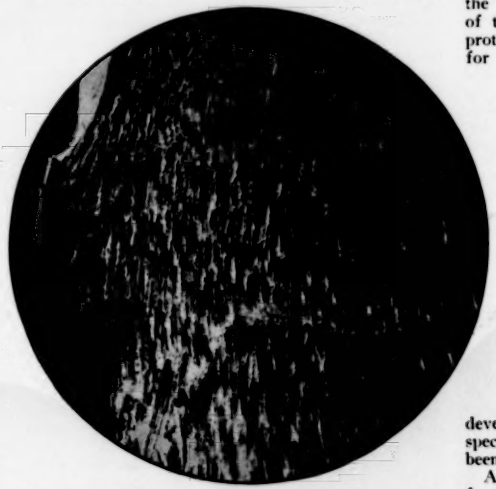

Fig. 7.—Distal segment seven weeks after operation (× 70).

trated 1 or 2 mm. further into the ground-work of the tube than would be judged from the gross appearance. During the first week the macroscopic corresponds with the microscopic tip, but from that time on the distance to which the axis cylinders have penetrated is judged with difficulty by the gross appearance.

After four weeks the gap, if 1 cm. or less in length, is completely filled with a firm, pearly white mass, having longitudinal striations. If the gap is longer there will still be found a part of the tube which is filled with a substance softer than the nerve, dark gray in color, into which the axis cylinders have not penetrated. At this period, in the length of gap mentioned above, a moderate number of axis cylinders have completely bridged the defect and invaded the distal segment. The axis cylinders on reaching the distal segment are no longer arranged in bundles. They are doubtless separated while passing through the material filling the tube, but the separation is mostly due to the more rapid advance of some of the fibers than of others, for in the later stages the fibers which have invaded the distal segment are again arranged in bundles.

Even at the fifth week the proliferative changes in the proximal stump and the regenerative changes are very marked. Enormous numbers of nonmedullated axis cylinders arranged in bundles of from twenty to sixty are found. Even as high as 2 cm. above the plane of section, nonmedullated axis cylinders are present in large numbers, but the medullated ones predominate. The advancing axis cylinders end in terminal bulbs at various levels. The axis cylinders which are grouped together are obviously derived from a single axon. The axis cylinders and medullary sheaths of the distal segment in the second and third weeks have undergone almost complete degeneration. Active proliferative changes in the neurilemmal cells are found, and the cytoplasm of these cells has become arranged in the form of protoplasmic bands which later will act as conduits for the advancing regenerating axis cylinders. The changes observed in this distal segment are those ordinarily noted after section of a nerve; the myelin sheath being broken up, the axis cylinders absorbed, a homogeneous matrix, evidently protoplasmic band substance being found. In the later stages, from seven to nine weeks, the distal segment contains a large number of nonmedullated axis cylinders, many being grouped to form distinct bundles, while others run singly.

That fascial tubes will remain patent and form a path for developing tissues has been demonstrated in the repair of tendons. Lewis and Davis[6] have had the opportunity of examining a fascial tube which was inserted for the purpose of permitting regeneration of the flexor sublimis and profundus digitorum tendons of the ring finger which had been lost as the result of infection. This tube, which measured three and one half inches in length, had been filled by a tendon developing from each flexor, as was shown when the specimen was examined 255 days after the tube had been inserted.

A serious objection which has been raised against fascial tubulization is contraction. If the fascial tube should undergo a great degree of cicatricial contrac-

Fig. 8.—Regenerated segment eight and one-half weeks after operation (× 325). End bulbs are seen at the growing tip of some of the axis cylinders. Arrangement in bundles is already well marked.

tion, the purpose of the operation would be defeated, for the newly formed fibers would be strangulated.

6. Lewis, Dean D., and Davis, Carl B.: Repair of Tendons by Fascial Transplantation, THE JOURNAL A. M. A., Feb. 21, 1914, p. 602.

Fascia is probably not used more frequently for neurolysis because of the fear of cicatricial contraction.

Fascia contracts immediately after being removed. This primary contraction is probably due to the elastic fibers which it contains and can be disregarded because it has reached its maximum by the time the fascial tube is inserted. The contraction which extends over a long period may be called the secondary or cicatricial contraction, and if this occurred to any extent in the fascial tubes, it would preclude the possibility of their use for nerve repair and neurolysis. There is but little secondary contraction if the fascia is sutured into place, and is subjected to the same conditions as regards stress and strain as in the part from which it was removed.

In the experimental work which has been hitherto done to demonstrate this cicatricial contraction, the fascia has been placed about the bowel, and it is probable that the changes in the fascia have been secondary to those in the peritoneum.[7] In this connection it should be mentioned that fascia undoubtedly undergoes cicatricial changes when placed adjacent to scars. Kredel has recently reported a case in which fascia was placed about an injured nerve in which there was a recent scar. Another operation had to be performed later because of pain which increased in severity, and it was found that the fascia had undergone cicatricial changes and was constricting the nerve. Kredel therefore regards it as inadvisable to use fascia for neurolysis. We believe that Kredel should not have used fascia about this recent scar. In such a case it would be better not to have attempted neurolysis, or to have resected the scar and after end-to-end suture to have performed a fascial neurolysis. Fascia in the presence of a recent scar or hemorrhage tends to undergo cicatricial contraction.

Fig. 9.—Distal segment eight and one-half weeks after operation (× 325). Utilization of old neurilemma sheaths as conduits by newly formed axis cylinders; note also grouping into bundles.

That fascia may be used successfully in neurolysis is indicated by a patient operated on by one of us (D. L.) eighteen months ago. This patient's radial nerve was cut in an automobile accident. Immediate suture was done, but an infection occurred and there was loss of radial function. In this case the scar uniting the nerve ends was resected at a second operation, and an end-to-end suture performed. A fascial flap was then placed about the line of suture. There has practically been a complete return of function following resection with suture and fascial neurolysis.

7. Kolb: Deutsch. Ztschr. f. Chir., 1913, cxxv, 399.

To avoid the possibility of cicatricial contraction, a lumen large enough for the developing nerves should be provided. The lumen of the tube in this work has been made approximately twice as large as the ends of the nerve. The fascia at first is much thicker than the perineurium, but in many cases it gradually becomes thinner and finally continuous with it. In some cases after from five to eight weeks, only the black silk orientation sutures remain to mark the original limits of the fascial tube at the ends of the gap. In other cases, as in one at four and one half months, it retains to a great extent its original characteristics; we have not yet been able to determine the factors which control this absorption or nonabsorption of the tubule.

In one case (Dog 17) the fascial tube was made so small that its lumen was less than 1 mm. in diameter, not more than one third of that of the nerve. This dog was killed six weeks and one day after the operation, and it was found that the tube had been converted into a connective tissue mass. But few regenerating axis cylinders had reached the distal stump.

In two cases veins were used instead of fascia. In one (Dog 15), a fresh segment of jugular vein obtained from the same animal was used. This procedure is more difficult than fascial tubulization. The vein wall is thinner and tears more easily when sutured. The specimen was examined after five weeks. Histologic examination showed that the endothelium and tissues of the vein wall had formed a cicatricial tissue which had grown inward and obliterated the lumen. Only a few axis cylinders had penetrated the center. Veins furnish no better results than fascia, and the technic of insertion is more difficult and time consuming.

Failures after tubulization may be due to several factors. Hemostasis must be as perfect as possible, hemorrhage from the cut ends of the nerve being carefully controlled, for a blood clot in the tube stimulates a fibroblast reaction which may be followed by dense scar formation. The soft brain-like pulp consisting of coagulated lymph and a few mononuclear leukocytes remains soft for some time and forms a bridge for the developing axis cylinders which is easily penetrated. The tube should not be applied under tension. It should be sufficiently long to be comparatively loose when fixed in position.

The reaction of fascia when placed over a recent scar has been already discussed when mention was

made of Kredel's unsuccessful case of fascial neurolysis. In order to avoid the possibility of much scar formation all dissections should be made with sharp instruments, laceration and contusions of the nerve ends and surrounding tissues being carefully avoided.

DISCUSSION OF RESULTS

Defects in nerves may be successfully bridged by fascial tubes. Histologic preparations show that the continuity of the nerve is reestablished. The medullary sheaths have not yet been formed in the specimens examined by us. These are formed late in the process of nerve regeneration.

Regeneration of the fibers which bridge the gap takes place entirely from the proximal stump, as has previously been shown by Ranson, Ranvier, Vanlair and Forsmann.

The proliferative changes in the proximal stump are very active. From fifty to one hundred times the number of axis cylinders normally found in a nerve are formed. If one out of fifty of these axis cylinders enters the empty sheaths of the distal segment it seems certain that both an anatomic and physiologic restoration of the nerve would occur. It has been demonstrated that a comparatively few axons will permit of functional activity on the part of the muscles supplied by them (Vulpius and Stoffel).

The time required for bridging depends on the length of the defect, also on the age of the animal, and the amount of tension exerted on the nerve ends. We believe that a gap of 1 cm. with proper use of this technic will be bridged in nine weeks, the axis cylinders at this time having passed well into the distal segment.

Fig. 10.—*A*, appearance of nerve removed seven weeks after operation, reduced one half. Lines indicate approximate extent of fascial sheath. *B*, same specimen divided longitudinally. Lines in fascial sheath indicate extent of former gap.

The oldest observations have been made on animals ten and sixteen and one half weeks after tubulization. Von Fleischhauer[8] in his clinical observations has found that a cicatrix in a nerve usually undergoes contraction seven or eight weeks after injury. In our oldest experiments there has been no evidence of secondary contraction in the tube. It has often thinned out so as to be almost indistinguishable from perineurium. We believe that the possibility of cicatricial contraction of the fascia is precluded when the proper technic is employed and the fascia inserted only under proper conditions.

ABSTRACT OF DISCUSSION

DR. A. A. LAW, Minneapolis: I think the simplest illustration of the tendency of the proximal nerve fragment to regenerate is shown in the neuroma. Levings showed us how, after resection of a nerve, with implantation of the severed ends between parallel muscle fibers, the proximal fragment sends out axons and causes regeneration. Forsman's theory of neurotropism explains the tendency of the nerve cells to find one another. Dr. Lewis has spoken of the various foreign bodies introduced about these nerve fragments in an attempt to aid regeneration, such as bone or magnesium, cylinders, blood vessels of men or the lower animals, Cargile and eggshell membrane, etc. These are all foreign bodies and as such must be taken care of by the host; and while they give a certain percentage of success, they are not of as much avail as autogenous transplants. The saphenous nerve resected and transplanted is interesting, but I am convinced that it is of little value over other methods, as the axons die. The blood vessels are objectionable, of which Dr. Lewis spoke, because they become occluded. In the University of Minnesota we have repeatedly wrapped sutured nerves with fascia or fat flaps. In recently operating on an avulsed brachial plexus, after section of the clubbed ends of the nerves and proper suture, we wrapped one trunk with a pedicled flap of aponeurosis and another with fat. The doctor spoke of the time element. Eight weeks ago we operated for destruction of the musculospiral nerve in a man who had been operated on four times before; after resection of the clubbed ends we found there was destruction of the nerve for three inches. Tubulization was done by fascia lata and at the end of eight weeks there was complete return of sensation and marked return of muscular control of that forearm. This fascial tube permitted nerve regeneration through it. There was a nonunited fracture of the humerus for which a bone inlay transplant was done; so we had two autogenous transplants in contact in the same field. We must conclude, then, that up to the present there is nothing available which parallels the value of fascia lata in aiding the regeneration of nerves.

DR. JOHN F. GOLDEN, Chicago: In Dr. Murphy's work we have found that the most difficult thing is to get function where we have a defect in the continuity of the nerve. We have gone through the various methods, including muscle implantation according to the method of Levin of Milwaukee, the use of catgut and the transplantation of nerve from the cadaver. The latter method we have found to be a failure. The other methods have been successful in proportion to the length of the defect in the nerve. As a later method of getting function we have been transplanting the tendons of functionating muscles into paralyzed muscles, or into the muscle which is negative through insufficient nerve supply. This has proved the most satisfactory. In neuroplastic work I should like Dr. Lewis to discuss the necessity of approximating like axons. One of the first principles in handling defects in nerves is to cut off the cicatricial neuroma that forms, or the brush-like ends, and prevent or stop any hemorrhage. The regeneration of nerves by the aid of fascial tubulation now seems to be successful, as shown by the histologic sections of Dr. Lewis, and this has perhaps solved the problem of supplying the defect in the nerve, which up to the present has had no real solution.

DR. KENITH MACKENZIE, Portland, Ore.: Four or five years ago I handled a case in which there was growing rapidly from the sheath of the sciatic nerve a sarcoma of low grade malignancy, producing disturbances which were very conspicuous. The patient complained of trouble with his foot on the affected side, which became severe. It became necessary to resect the sciatic nerve. I removed the nerve

8. Von Fleischhauer: Berl. klin. Wchnschr., 1915, lii, 212.

from the lower border of the gluteus maximus muscle and exposed the two ends of the popliteal. Following this operation there was trophic disturbance and it looked as though the leg would drop off — blebs, bullae, etc., and ulcerations occurred. In this crisis it occurred to me that I might do a neuroplastic operation, so I exposed the nerve and brought the fibers to the end of the popliteal, making first an anastomosis between the external and the internal popliteal. The flap was nineteen inches in length and it bridged the gap. The only thing I did to protect the filaments was to cover over with muscle; this is important I believe. The main effect of this operation was striking. Almost instantly the trophic disturbances ceased and color and animation came back to the leg. In four weeks I attacked the internal popliteal segment and treated it in the same way, bridged it with muscle and got primary union. There was no motion in the leg for some months afterward. One day he began to manifest signs of movement of the toes and this continued and sensation became restored, and after eighteen months the man was able to run and walk, although he had much loss of sensation. With fascial tubulization and utilization of tendons one may get recovery of function, together with sensation and motion by that operation which may seem best to do at the time.

DR. F. W. RINKENBERGER, Los Angeles: I wish to report a case bearing on this subject, showing benefit from the fascial flap. A man was caught in the gears of a motor boat and had his left arm badly mangled, both ulnar and median nerves being severed. We did a primary suture, getting success with the median but failure with the ulnar, paralysis resulting. He had trophic disturbances over the wound, in the skin, for six months. We grafted twice. At the second operation, after removing the cicatricial tissue, the nerve was too short to unite so there was a question in our minds as to the best procedure. The nerve was transplanted from behind the condyle and passed through a tunnel in the pronator group and then a fatty fascial flap thrown around the point of union, leaving the pedicle attached. The man is an ardent sportsman and I had a letter last week in which he said, "Doctor, I am able to handle my gun for the first time and I have more grip." It is too early for a final report as yet, although apparently successful the second time.

Fig. 11.—Histologic preparation of fascia at end of sixteen and one-half weeks. This fascia has undergone no cicatricial changes and is in the same condition as at the time inserted. After this length of time no contraction or replacement of the fascia is expected.

DR. DEAN LEWIS, Chicago: It is a matter of prime importance in nerve surgery to recognize the arrangement of motor and sensory axis cylinders. It seems probable that many of the poor results in nerve surgery are due to our failure to recognize this arrangement. As the degenerated distal sheaths act as conduits for the regenerating axis cylinders, we should have the ends of the fibers in as near a line as possible, for our results will be vitiated if motor axis cylinders pass down the degenerated fibers of sensory nerves. Until we know differently, it is well to preserve this relation, for neurotropism, as far as I know, cannot direct motor axis cylinders into the sheaths of degenerated motor fibers of the distal segment, and we have to depend on good alignment to secure this result. I believe that the good result in Dr. MacKenzie's case is due to the muscular tubulization which he performed when he sutured the muscle about the nerve fibers employed in the neuroplastic operation. Muscle has been used for tubulization, but it has its disadvantages. In the first place, muscle is subject to contraction and relaxation when in action, interfering with the caliber of the tube. A tube can be formed from fascia which will conduct nerve fibers and will not contract. The supply is practically unlimited and the fascia can be removed without interfering with function of the part from which taken — decided advantages over any other kind of autoplastic material.

BOTULISM, AN EXPERIMENTAL STUDY

A PRELIMINARY REPORT *

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An experimental study of botulism was suggested by the fact that in the investigation of an epidemic which occurred at Stanford University in the autumn of 1913, Wilbur and Ophüls[1] found that it differed from the previously reported epidemics in two important respects, namely, that the poisoning was apparently caused by the ingestion of a salad which had been prepared from home-canned beans, and that on postmortem examination of the only fatal case it was found that there was a widespread thrombosis in the blood vessels at the base of the brain and in some of the small blood vessels in the substance of the brain. Since in previous reports on botulism it has been emphasized that the condition is produced only by the ingestion of spoiled meats, and that the characteristic lesions occur only in the Nissl granules and nuclei of the nerve cells, it was deemed important to determine whether it is essential that animal protein be present in order that the *Bacillus botulinus* may produce its toxin, and whether the lesions are in fact confined to the finer elements of the nerve cells.

The facts that botulism is due to the action of a specific toxin, and that the toxin is produced by the growth of a strictly anaerobic, spore-bearing bacillus

* Read before the Section on Practice of Medicine at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

† From the Division of Medicine of Leland Stanford, Jr., University School of Medicine.

1. Wilbur, Ray Lyman, and Ophüls, William: Botulism, A Report of Food Poisoning Apparently Due to Eating of Canned String Beans, with Report of a Fatal Case, Arch. Int. Med., October, 1914, p. 389.

in a pabulum which contains animal protein, were established by van Ermengem[2] during the investigation of an epidemic which occurred in Ellezelles in 1895. Van Ermengem found that the poisoning had been produced by the ingestion of spoiled ham, and he was successful in reproducing the condition in animals by feeding the ham and by injecting small quantities of the macerated ham. He also found that in the ham and in the spleen of one of the victims there was a large, gram-positive bacillus which proved to be anaerobic and spore bearing. In his further experiments he found that the bacillus itself was not pathogenic to animals which were susceptible to botulism, but that if the bacillus were grown in a medium containing meat a toxin was formed which produced the symptoms. The experiments of van Ermengen and others showed that the toxin was produced only under strictly anaerobic conditions, that it was rarely found unless the medium was alkaline in reaction, and that it was rapidly destroyed in the presence of light or air or by heating to 80 C. (176 F.). They noted that the presence of the organism was indicated by a peculiar rancid odor which strongly resembles that of butyric acid.

Botulism has long been recognized as a distinct type of meat poisoning, and many epidemics have been recorded in literature, especially in Germany. It has been most frequently observed after the ingestion of spoiled sausages and so obtained its name. With the exception of Wilbur and Ophüls' series, I have been able to find but one report of an epidemic in which the condition was recognized as botulism and which was proved to be due to the ingestion of spoiled vegetables. An epidemic occurred in Darmstadt in 1904 in which twenty-one persons became ill and eleven died after eating bean salad. Landmann[3] investigated the epidemic and proved that the beans were responsible for the poisoning. He successfully inoculated white mice with salt solution in which the beans had been macerated and he recovered the *B. botulinus* from the beans, but he concluded that the beans must have been cooked with pieces of meat because "it is not possible to cultivate botulinus on other than meat-containing medium." There have been, however, at least two epidemics in California which are of interest in this respect. In 1910, Peck[4] reported a series of eleven fatal cases of "ptomain poisoning" in which death followed the eating of "sour" home-canned pears, and in which the symptoms which he described are very similar to those observed in botulism; and quite recently there was an epidemic in Fallbrook in Southern California in which a diagnosis of botulism was made, and in which the most probable cause of the poisoning was spoiled home-canned apricots.

The symptomatology of botulism has been summarized by van Ermengem as a neuroparalytic symptom-complex with disturbances of secretion, and symmetrical partial or complete motor paralyses which apparently have their seat in lesions of the central nervous system. The first symptoms do not occur earlier than from twelve to twenty-four hours after ingestion of the infected food, although they may appear much later. In contrast to the usual types of food poisoning there is apt to be little evidence of acute gastro-intestinal disturbance, and obstinate constipation is more frequent than is diarrhea. There is usually a decrease, but there may be an increase in the secretion of saliva and of mucus in the mouth and in the throat, and when mucus is present it is extremely viscid. There is early disturbance of the external and internal muscles of the eyes which manifests itself by blepharoptosis, mydriasis, disturbances of accommodation, diplopia and strabismus. General muscular weakness is common. There may be dysphasia or aphonia and there is usually great difficulty in swallowing. The absence of sensory disturbances is characteristic.

The symptoms gradually increase in severity, and when death occurs it is usually from respiratory or cardiac failure, as in bulbar paralysis. When recovery takes place there is a long and tedious convalescence with a slow return of muscular strength. The condition so closely resembles that seen in gelsemium or hyoscyamin poisoning, poliomyelitis, cerebral syphilis and bulbar paralysis, that isolated cases may readily escape recognition, but when a series of cases is seen, and especially if all have partaken of a common article of food, there is usually little difficulty in establishing a diagnosis.

Although the symptoms are essentially those indicative of involvement of the central nervous system, comparatively few brains of human victims have been carefully studied. Almost all of the observations on the type of the pathologic lesions have been made on the brains and cords of animals in which the poisoning has been experimentally produced. Van Ermengen[2] made a careful study of the tissues from the animals of his original series and he described, as the most important lesion, a type of degeneration in the Nissl granules of the ganglion cells. The lesions were most marked in the cord and were almost entirely restricted to the cells in the motor portions of the cord. They were less numerous in the medulla, pons and peduncles, and were almost entirely absent in the forebrain. He also described a hyperemia of the blood vessels in all the organs, and he believed it to be a primary hyperemia because of the presence of degenerative processes in the endothelial cells, and of numerous "microscopically diffuse" hemorrhages in the intestine, stomach, liver, kidneys, lungs, muscles and central nervous system, especially about the cord and medulla. He noted leukocytic infiltration in many of the organs, and early parenchymatous degeneration in some. Marienesco[5] also studied the brains and cords of the animals of van Ermengem's series and his findings agreed with those of the latter. The lesions of the Nissl granules seem to have attracted the most attention, and their occurrence was confirmed by Kempner and Pollack,[6] Römer and Stein[7] and Ossipoff,[8] although the latter author made the additional observation that within the hyperemic blood vessels, as well as on the outside, there were many white blood corpuscles, and that within the blood vessels these leukocytes were often "bunched in masses."

In the examination of the tissues of the patient who died in the Stanford University epidemic, Ophüls[1] found a well-marked thrombosis of the vessels of

2. Van Ermengem: Ztschr. f. Hyg. u. Infectionskrankh., 1897, xxvi, 1; Arch. de pharmacod., 1897, iii, 213, 499; Handb. d. path. Microorg., Kolle und Wassermann, 1912, iv, 909.
3. Landmann: Hyg. Rundschau, 1904, xiv, 449.
4. Peck: South. California Pract., 1910, xxv, 121.
5. Marienesco: Presse méd., 1897, v, 43.
6. Kempner and Pollack: Deutsch. med. Wchnschr., 1897, xxiii, 505.
7. Römer and Stein: Arch. f. Ophth., (Graefe's), 1904, lviii, 291.
8. Ossipoff: Ann. de l'Inst. Pasteur, 1900, xiv, 769.

the meninges and of the brain, a type of lesion which had not previously been described. Thrombi were present in the right vertebral artery, in the basilar artery and several of its branches, in the veins around the medulla and pons, and in the vessels of the tela choroidea. There were also thrombi in many of the blood vessels in the substance of the stem, some of them being in close proximity to the important nuclei. The thrombi contained much fibrin and many leukocytes but there were very few conglutinated blood platelets. In the cortex of the cerebrum there was marked hyperemia but no thrombi. The Nissl granules appeared to be normal. There was marked hyperemia of the abdominal viscera. One small thrombus was found in a vein of the intestinal submucosa and a few in the cortex of the ovaries, but there was no evidence of a general tendency to thrombosis.

The normal habitat of *B. botulinus* is not known, although Kempner and Pollack[6] succeeded in cultivating the organism from pig's feces. It is of interest that in the reports of two of the California epidemics it was noted that the people lived in unhygienic surroundings, and that pigs were kept near the house, but it is impossible to say whether this had anything to do with the contamination of the foodstuffs.

As I have already stated, the object of our experiments was twofold: first to determine whether it is possible for the toxin of botulism to form in a vegetable medium, and second, to see whether the lesions that result from the intoxication are confined to the nerve cells of the central nervous system. The first series of experiments were carried out as follows: About 1 c.c. of a suspension of *B. botulinus* in normal saline was injected through a nail-hole in the tops of cans of string beans which were then resealed with solder. The beans were obtained from a grocery store and were high-grade, one-quart cans, and the strain of *B. botulinus* was obtained from the New York Museum of Natural History. The cans were allowed to incubate at room temperature for periods of from three to twelve months, after which they were opened, the reaction of the contents was tested in nearly all cases, aerobic and anaerobic cultures on various mediums were made, and portions of the fluid from the cans were injected into guinea-pigs, rabbits and cats.

Fig. 1.—Thrombosis in vein in deep sulcus of cerebrum of Cat 35. Note the large number of leukocytes which are enmeshed in the fibrin. (Toxin from canned beans.)

In order to supplement the first series of experiments another series was undertaken in which infusions of canned string beans, canned peas, pork and beef were inoculated with the same strain of *B. botulinus* as was used in the first experiments, and with another strain which was obtained from Prof. Hans Zinsser of Columbia University. In the second series the mediums were made alkaline to phenolphthalein, and about 1 per cent. of glucose was added as was recommended by van Ermengem. Anaerobic conditions were produced by covering the fluid mediums with a thick layer of liquid petrolatum. The cultures were incubated at from 22 to 28 C. for from three weeks to two or three months. The meat infusions were used to determine whether the toxin which was produced in a meat medium would produce the same type of lesions as that which was produced in a vegetable medium. The inoculations were made in the same species of animals as were used in the first series.

In Series 1, twelve cans of beans were inoculated in the manner described, but four of them were later discarded because four of the control animals died shortly after they had been inoculated with fluid from the cans. It may be stated, in passing, that the cause of death in the four control animals was not ascertained. The reaction of the contents of the cans after incubation ranged between 1.7 and 3.2 per cent. acid to phenolphthalein, the majority varying from 2 to 2.5 per cent.[9] From six of the cans *B. botulinus* was recovered in pure culture. Sixteen guinea-pigs, 16 rabbits and 13 cats were injected with the fluid from the cans, and of these, 4 guinea-pigs, 7 rabbits and 5 cats died as a result of the injections. A number of the animals showed some symptoms for a few days after injection but eventually recovered. Of the 16 animals which died, 13 (3 guinea-pigs, 6 rabbits and 4 cats) showed the characteristic lesions which will be described below.

The proportion of the animals of Series 2 which succumbed to the injections cannot be given at present as the experiments are not yet completed and there are still a number of animals under observation However, there are 22 cases in which death occurred after inoculation and which show the same type of lesions as was found in the animals of Series 1. Of these, 1 guinea-pig, 1 rabbit and 2 cats were injected with infusion of canned string beans, 2 guinea-pigs and 1 cat were injected with infusion of canned peas, 3 guinea-pigs, 3 rabbits and 4 cats were injected with beef infusion and 2 guinea-pigs and 3 rabbits were injected with pork infusion.

Van Ermengem has described the symptoms of botulism in animals as follows: In rabbits the appearance is that of a more or less marked local or general paralysis. The animals remain motionless with the front legs stretched out, the hind legs drawn close to the body and the head turned to one side. Respiration is shallow and stertorous. The pupils are dilated, there may be exophthalmos, and the nictitating membrane is flaccid. There may be retention of the urine and feces. At times there may be clonic convulsions, and the animal frequently utters a loud cry during the death struggle. In guinea-pigs the appearance is very similar. The first indication of poisoning may be a relaxation of the abdominal muscles which can be easily made out by palpation. The

9. The reaction is given in terms of the standard recommended by the American Public Health Association for the standardization of the reaction of culture mediums.

animals lie motionless with all the legs extended. Frequently in the more chronic cases there is a persistent prolapse of the penis. In cats the symptoms are so characteristic as to be pathognomonic. There is early mydriasis and often paralysis of the lids. There is frequently aphonia, a croupy cough due to the presence of thick mucus in the larynx, dribbling of mucus from the mouth and prolapse of the tongue. There may be retention of the urine and feces and complete anorexia. In the acute cases there may be complete paralysis of the voluntary muscles, but in the chronic cases the paralysis may be local and may persist for weeks. In some cases in which the progress of the condition is prolonged there may be only a progressive cachexia which may persist for weeks.

In the majority of our cases the more acute manifestations of the poisoning were absent and the animals survived for from three to six or seven weeks after the administration of the poison, but a few died within ten days after inoculation, and in these the symptoms corresponded closely to those described by van Ermengem. In the cats especially the symptoms were very noticeable and there was no difficulty in recognizing the symptom-complex that has been described.

At necropsy in the fatal cases the characteristic hyperemia of the abdominal viscera was well marked in nearly all cases, and in a moderate number there was a definite enlargement of the spleen. In a few cases the *B. botulinus* was recovered from the spleen, but as a bacteriologic examination was not made in all cases it is impossible to say in what proportion they may be found. The meninges of the brain were usually congested and occasionally macroscopic hemorrhages were seen. In fact the gross appearance of all the organs was identical with that which has been described by van Ermengem and others.

Fig. 2.—Thrombosis in posterior cerebral artery, Guinea-pig 53. (Beef infusion.)

In the present report no attention will be paid to the microscopic pathology of any of the organs excepting the brain and the upper portion of the cord, as the study of the other organs has not yet been completed. In the brain the lesions correspond accurately to those which were observed by Ophüls in the case which he and Wilbur reported. The vessels of the meninges and of the brain are all much congested, and it is not at all uncommon to find large and smaller hemorrhages in the meninges, especially in the folds in the sulci of the cerebrum and the cerebellum. A very frequent seat of hemorrhage is in the dorsal sulcus of the stem beneath the posterior portion of the cerebral hemispheres. At times the hemorrhages are strictly confined to the meninges, but very often they invade the peripheral portion of the brain tissue for varying distances. At times there are also small and larger hemorrhages in the tissue of the brain, and these have been seen in the stem, in the cerebrum and in the cerebellum.

The most striking feature in these cases, as also in Wilbur and Ophüls' case, has been the presence of thrombus in the blood vessels of the meninges, and occasionally of the brain itself. In the case in which but little thrombus is found it is more frequently situated in the veins of the folds of the meninges within the sulci of the cerebellum and the cerebrum or between the cerebrum and the stem. In other cases in which there is more thrombosis, practically all of the large and smaller veins of the meninges as well as many of those in the tela choroidea may be involved. In a fair percentage of cases the arteries also contain thrombi, and in a few cases thrombi are seen in the small vessels in the interior of the brain.

The appearance of the thrombus varies considerably. At times it consists of dense masses of fibrin in which neither leukocytes nor conglutinated blood platelets are seen, but more frequently there are many leukocytes enmeshed in the fibrin so that it appears as a closely packed mass of cells. At times there are masses of conglutinated blood platelets in the thrombus, and in a few cases there are masses of conglutinated blood platelets in which leukocytes are embedded in places where no fibrin is seen. The appearance of these masses corresponds closely to the description of the masses of leukocytes which were described by Ossipoff.

The appearance of the lesions differs to a certain extent in each of the species of animals that was used, although, on the whole, there is a remarkably close resemblance in all. In the guinea-pigs and in the rabbits there is much greater tendency to hemorrhage than in the cats, and in the cats there is much more marked infiltration with leukocytes than in the guinea-pigs and rabbits. However, the difference is not very clearly defined and in some of the animals of all the species the lesions are practically identical.

The extent of the distribution of the thrombosis has not yet been determined. Thrombi have been seen along the upper portion of the cord, along the pons and medulla, in the meninges of the cerebellum and in the meninges of the cerebrum. Complete examination of the whole of the central nervous system has not yet been made, but it seems probable that the lesions which occur are secondary to disturbances of blood supply. That certain groups of vessels are usually involved is indicated by the uniformity of the clinical symptoms, but there seems to be no doubt that lesions may be found in any part of the central nervous system, their location being dependent on the more or less accidental distribution of the thrombosis. It has not as yet been ascertained that the thrombosis is restricted to the vessels of the central nervous system. Further study of the different organs of the body is necessary before this point can be settled.

In Series 1 of these experiments in which it has been shown that the toxin of botulism may develop in peas and beans in which the *B. botulinus* has grown, the significance is very evident. Leuchs[10] recorded that Professor Gaffky had told him that he had succeeded in growing the Darmstadt strain of

10. Leuchs: Ztschr. f. Hyg., 1910, lxv, 55.

B. botulinus on a bean medium, and that the toxin had been produced, but I have been unable to find any detailed description of Gaffky's experiments, and it has not been generally understood that such experiments have been performed. The prevailing impression concerning botulism is that the toxin is produced only in the presence of animal protein and in an alkaline medium, and that there is no danger of this particular type of food-poisoning from the ingestion of spoiled vegetables and fruits. The danger of improperly prepared canned meats is so well known that few people attempt to prepare them at home, but the canning of fruits and vegetables is thought to be perfectly safe, and large amounts of fruit and vegetables are canned at home each year. That the methods of sterilization in home canning are inadequate is shown by the fact that it is not at all uncommon for the housewife to find that some of the cans of fruit and vegetables have spoiled. The U. S. Department of Agriculture[11] has issued bulletins in which is emphasized the importance of fractional sterilization of all canned goods which are preserved at home. In canning factories where the danger of contamination with spore-bearing bacteria is understood and where sterilization is done with steam under pressure, there is little danger of contamination, but when the material in the cans is subjected to a single sterilization with live steam, there is very grave danger if the food or the cans happen to contain spores.

That canned goods form an ideal location for the growth of the *B. botulinus* and for the development of the toxin, there can be no doubt. The organism is an obligative anaerobe which forms its toxin best in the dark and at a temperature of from 22 to 28 C. (71.6 to 82.4 F.). The spores resist a temperature of 85 C. (185 F.) for nearly half an hour, and it is extremely doubtful whether in the ordinary method of steaming the cans for an hour, or even more, in a loosely covered wash-boiler, the temperature in the centers of the cans is maintained at a point sufficiently high to kill the spores.

The important facts that have been established in the first series of experiments are two in number; first, that the toxin of botulism may develop in a vegetable medium to which no meat has been added, and second, that the acidity of the ordinary canned vegetables does not prevent its formation. The investigation has thus far been restricted to canned string beans and canned peas; but if we can accept the evidence of the two series of cases in Southern California, there seems to be little doubt that certain fruits as well as certain vegetables may furnish suitable pabulum for the development of the toxin.

The demonstration of the thrombosis in the blood vessels and of the hemorrhages in the meninges and in the brain is of more purely academic interest. Their presence indicates that there must be some specific action on the circulatory system which causes increased permeability of the vessel walls and which promotes thrombosis. Whether there is a primary damage of the endothelial cells, as was suggested by van Ermengem, remains to be proved, but whatever may be the explanation for the changes which occur in the blood vessels, there is little doubt that the changes which are found in the structure of the nerve cells are secondary to diminution of the blood supply. One can much more readily understand the variations in the clinical course of patients affected with botulism on the basis of local disturbances of blood supply than on that of specific damage to certain groups of nerve cells. The fact that, as a rule, the majority of patients recover may depend on the fact that a fatal termination is dependent on the accidental location of the thrombus in vessels which provide the blood supply to those portions of the brain which contain the vital centers. It is significant that in the experimental cases in which the subject succumbed most quickly there was a much more widespread thrombosis than in others in which death followed more slowly. It may well be that in the more virulent epidemics a larger number of the vessels are affected and that there is therefore greater chance of the vital centers becoming involved.

11. Bull. U. S. Dept. Agric., Farmer's, Nos. 262 and 359.

CONCLUSIONS

1. The presence of animal protein is not essential for the development of the toxin of botulism.

2. The toxin may be produced in a medium made from string beans or from peas.

3. An acid reaction of as much as 3.2 per cent. to phenolphthalein does not prevent the formation of the toxin.

4. The toxin produces some disturbance of the circulatory system which leads to hyperemia and hemorrhages in the meninges and in the central nervous system, and to thrombosis in the arteries and veins of the meninges and of the central nervous system.

5. The lesions in the nerve cells are not due to a specific action of the toxin on the cell protoplasm, but they are secondary to disturbances of blood supply.

THE EARLY DIAGNOSIS OF MASTOIDITIS *

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LOS ANGELES

There is no experience in the life of the otologist that is more pathetic than to be called in consultation a few weeks after the onset of an acute purulent inflammation of the middle ear, to find a patient with a history of recurrent chilly sensations, temperature from 100 to 105 degrees, anxious expression, clammy skin, symptoms of a lateral sinus involvement, or to find the patient with a rapid pulse, high temperature, headache, contracted pupils, anxious look, often delirious, and symptoms sometimes of meningitis. In either condition the prognosis is grave, and in the latter more so than in the former. I want to go a little further than the subject implies, and discuss indications for early operation and say a word about who should operate.

It may be stated that the earlier a case of mastoiditis is detected and given operative treatment, the earlier and more complete the recovery, and more positive the preservation of normal hearing during the life of the individual. It is remarkable the number of cases of so-called catarrhal deafness and middle ear sclerosis that apply for treatment, showing scar tissue in the drum membrane, evidence of a discharging ear at some time in life, many times the early occurrence of the disease having been forgotten. There is a class of patients with partial or complete absence of drum

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membrane and ossicles, the result of suppuration and healed mastoid, and progressive deafness. Many such patients come for relief at the productive years of life and are dependent from an economic sense on good hearing. There is an unusual indifference both among physicians and the laity in regard to the danger of a discharging ear. Advisedly speaking, those with a chronic discharging ear submit to an operation only when pain or one of the severe complex symptoms of a chronic mastoiditis drives them to consult an aurist.

The uniform good results in the hand of the man skilled in surgery of the mastoid are not appreciated except by a few. Otherwise, many who attempt the operation would do so only under exceptional conditions. Among the bad results that not uncommonly follow operation by those not familiar with surgery of the mastoid are deformity, slow healing often extending over a number of years, facial paralysis, and persistent discharge from the auditory canal. Such a series of bad results can be nearly completely prevented by educating the public to a knowledge of the results obtained by the skilled otologist, as compared to the general surgeon who has performed but few such operations.

Fig. 1.—Area of light indicates normal cells; irregular areas of dark shadows are cells filled with fibrous exudate. Compare with normal mastoids shown in Figures 3 and 5.

The surgery of the ear, nose and throat owes its advance to skilled men and specialists in these regions, and no one not prepared for such work by a skilled preceptor should be permitted by public opinion to undertake major operations. It is my custom in lecturing to a senior class to dwell on the symptoms and diagnosis of mastoid disease, ignoring altogether any reference to the surgical technic of mastoidectomy. There is no excuse for the young graduate being imbued with the idea that the day he enters the profession he is prepared to do such operations as a gallbladder, a thyroidectomy or a mastoidectomy.

During the past winter I have operated in three cases in which the surgeon had failed by lack of special training. One case was an attempted cure of a chronic mastoiditis with cholesteatoma by doing a simple mastoidectomy. Another was a Wilde incision for the relief of an acute purulent mastoiditis.

The foregoing observations have a bearing on the title of the paper, for I want to recall some of the early symptoms of mastoiditis and the good results which attend early surgery by surgeons who are especially trained.

Fig. 2.—More distinct light areas than in Figure 1; exudation into cells not so profound as in Figure 1, though recovery much slower.

The question has been asked me, "When does a case of mastoiditis become an emergency operation?"

Figure 3.—Normal mastoid cells. Cells and septa white and distinct.

The time to operate in a case of acute mastoiditis is as soon as the diagnosis is established. This does not mean that all patients will submit to operation, or that a case of acute mastoiditis will not recover apparently without operation.

Probably in every case of middle ear abscess with spontaneous rupture of the tympanic membrane, and likewise most cases when paracentesis is delayed, more or less involvement of the mastoid has occurred,

Fig. 4.—Mastoid cells obliterated by a process of eburnization. No white spots or cells visible as in Figure 3, the opposite mastoid.

and in the beginning is a serous or seropurulent exudate and sometimes pus. The cases that recover most rapidly after operation are those in which operation is performed before bacteria have invaded the serous or seropurulent exudate. If an early operation is

Fig. 5.—Normal mastoid. Septa separating cells distinct.

worth anything, how are we to know when a case will recover without operation, and when operation is indicated?

Many cases of mastoiditis recover without operation, and recovery is hastened by early paracentesis. It may be said that a mastoid with an infection, going to spontaneous recovery, is more liable at some future time to become the focus of a new infection, than a mastoid that has never been involved. This remark is based on the observation that a number of cases in which operation is performed for acute mastoiditis show an unusual amount of cell obliteration, which is not normal or due to the sclerotic changes of age, and must have been due to old inflammation. The amount of bacteria found in the exudation from the middle ear after a paracentesis will aid in forecasting in a measure the final outcome. Absence of bacteria, or very few, in the very beginning of the disease is favorable to early recovery. A mixed infection indicates a probable extension of the disease to the antrum and mastoid cells.

The less tension of the pus in the middle ear and antrum shown by the absence of pulsation in the secretion as it flows from the opening in the drum membrane, the less liability of involvement of the mas-

Fig. 6.—Round white spot is the external auditory canal. Posterior bony wall destroyed as described in text. Darkened area to right of canal is mastoid cavity filled with cholesteatomas.

toid cells. The more pronounced the tension as shown by pulsating discharge from the middle ear, the more possible the mastoid involvement, and in consequence the more certain are the indications for early operation. Temperature in simple middle ear infection after paracentesis or spontaneous rupture of the drum should disappear very quickly. If it persists, the mastoid is involved.

Tenderness in some regions of the mastoid is a valuable sign, but may be absent even when the mastoid cells are full of pus. Pain in some region of the head on the affected side is usually present.

The two most valuable signs of mastoiditis are pulsating discharge from the middle ear, and temperature. With these symptoms a case may go to spontaneous recovery in from ten days to two months. Nevertheless, these two symptoms alone should suggest early operation.

The diagnosis of a chronic mastoiditis is often more difficult than the diagnosis of an acute mastoiditis.

Those with chronic discharge in all probability have, if not some active process in the mastoid, some disease of the antrum. The destruction of bone may be all out of proportion to the clinical signs. Continued pain on the side of the head, with or without temperature, and a history of discharging ear at some time on that side, is highly suggestive of a diseased mastoid. Blood examination of either acute or chronic mastoiditis as a diagnostic aid is of some value, but cannot change the clinical or Roentgen-ray signs, and in consequence is unnecessary from a practical standpoint. In those cases in which vaccine therapy may be contemplated, its value is inestimable.

The value of the Roentgen ray in the hand of an experienced roentgenologist, as an aid in determining any involvement of the mastoid cells, is beyond dispute. This method of diagnosis for years has had the indorsement of leading otologists. In spite of their advice, very few men in our specialty are employing this method of diagnosis today. The interpretation of

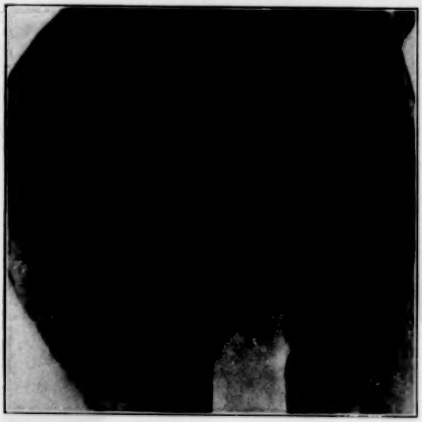

Fig. 7.—Semicircular canals and cochlea unfortunately do not show distinct in picture. Plate exhibited at meeting of section showed superior and horizontal canals and cochlea clear and distinct. Picture taken anteroposteriorly.

plates should be by the otologist and not by the roentgenologist. The clinical experience of the roentgenologist is in but few cases sufficient for him to recognize other than that the mastoid is abnormal. The clinician may be able to tell, in comparison with the normal mastoid, whether a mastoid is filled with a hemorrhagic exudation, pus, cholesteatoma or sclerosed bone. A subperiosteal abscess alone or accompanying a mastoiditis may sometimes be diagnosed. The position of the head on the plate will govern the value of the picture. The head should be inclined at an angle of about 25 degrees. For comparison it is necessary to take a picture of both mastoids, and unless this is done, in many cases a diseased mastoid may be passed as a normal mastoid. Many of the cells may look so distinct that cloudiness is detected only by comparison.

The Roentgen ray will show advisedly a condition often observed in a mastoid going to spontaneous recovery and, after the drum membrane has healed, a remaining exudation in the cells, with a beginning sclerosis of the cells or eburnization. This is a pathologic change that subsequently produces a deafness.

Fig. 8.—Normal mastoid, anteroposterior view.

The deafness may be so slight that the patient makes no complaint, but in after years the deafness becomes perceptible. A careful examination at time of recovery will demonstrate often a loss of both air and bone conduction.

Fig. 9.—Opposite mastoid as shown in Figure 8. Cloudiness of mastoid due to sclerosis from old mastoiditis at time of operation; dura in region of mastoid thick and hyperemic; evidence of old localized meningitis.

Figures 1 and 2 show the right and left mastoid cells of a patient having recovered from an acute double middle ear abscess, the symptoms of double mas-

toiditis. The right healed at the end of fourteen days and the left at the end of the fifth week. That is, the perforations were closed, and active inflammation in both ears had disappeared. These two pictures were

Fig. 10.—Large whitish area to the left is region of excavated mastoid. To the right are three distinct white spots indicating remnants of lateral sinus.

taken at the same time, and at the end of the eighth week.

Examination of the plates shows a cloudiness obscuring most of the cells except those at the tip of

Fig. 11.—Normal mastoid.

the right side. In the left a condition of cloudiness exists, less than half as much as on the right side. In this man there is a slight loss of both air and bone conduction, and more pronounced on the side that first recovered and on the side with the cells most obscured. There will probably be in this case a slow progressive deafness.

In the beginning, every precaution was taken to avoid serious consequences by doing a double paracentesis the day following the onset of the disease. Drainage was as near perfect as possible from the middle ear. The disease had affected the mastoid cells before paracentesis had been performed.

Figures 3 and 4 are the normal and abnormal mastoids of a patient who had suffered from an acute exacerbation of a chronic mastoiditis, and was treated for years as a simple discharging ear. She had had numerous attacks of severe earache, that in time disappeared. The roentgenogram shows all the cells diseased, and operation disclosed a complete sclerosis of the mastoid, a condition that had been in development since the beginning of the first middle ear infection. This patient developed facial erysipelas the fourth day after the operation.

Figures 5 and 6 are the normal and abnormal mastoid process in a patient with a chronic discharging ear,

Fig. 12.—Appearance of opposite mastoid forty-eight hours after onset of an acute otitis media purulenta. Leaflike blur on plate points to obliterated mastoid cells.

temperature and postauricular fistula. The plate of the abnormal side, as compared with the right and normal, shows an abnormally large auditory canal, all out of proportion to the normal. The mastoid process, on operation, was found completely filled with cholesteatoma. The operator had allowed the posterior cartilaginous wall to remain, as well as the annulus tympanicus.

Figure 7 demonstrates the possibilities of the Roentgen ray in examination of young children in supposed involvement of the semicircular canals and cochlea, in congenital or acquired diseases. In the illustration the superior and horizontal canals, as well as the cochlea, are shown.

Figures 8 and 9 show a sclerosed mastoid producing intense pain in the occipital region, history of a discharging ear at one time, drum intact and retracted, color of drum normal, scar in posterior quadrant of drum; heard whisper on contact. External clinical

symptoms not clear as to the mastoiditis. Roentgen examination gives a complete and unquestionable diagnosis of mastoid involvement, and operation disclosed pus in the antrum and a few adjacent cells. This is a case illustrative of many apparently spontaneous cases of a discharging ear that in the beginning of the infection should have had the mastoid drained, and also that we now and then find pus in a mastoid with an intact drum.

Figure 10 is a picture (taken eight weeks after operation) of a boy aged 13, a sufferer when 10 years of age from an acute discharging ear followed by what was pronounced meningitis and abscess of the lung. The ear continued to discharge up to the time of operation. The symptoms at time of operation were those of an acute exacerbation of a chronic mastoiditis. The interesting feature of this case was the complete obliteration of the lateral sinus found at operation. Obliteration of the sinus had probably taken place years before and at the time of the lung abscess. This is among the rare cases that now and then come to the otologist.

Figures 11 and 12 are the normal and abnormal mastoid taken forty-eight hours after the onset of an acute middle ear abscess, and four days after doing a submucous resection of the septum. In Figure 12 the mastoid process is cloudy, but unless compared with the normal mastoid, might pass for normal.

IDIOPATHIC MASTOID ABSCESS *

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The term "idiopathic mastoid abscess" I wish to be understood as meaning an abscess in the mastoid process of the temporal bone without any immediately preceding or accompanying inflammatory involvement of the tympanum. It will be observed that the definition is made particularly restrictive in that it specifies merely inflammatory involvement, not abscess, of the middle ear, as there are many cases in which it would be difficult to demonstrate an actual abscess, and yet the mastoid disease would still be plainly an extension of the tympanic inflammation. Similarly, the term "primary mastoiditis" is not used here, save in reference to other observers' reports containing it, where the meaning is the same as meant by me. A primary infection is taken in so many different ways when used in reference to infections elsewhere in the body that it seems an undesirable designation in this connection.

Perhaps the chief reason that many observers have honest and firmly fixed doubts as to the entity of the affection is that they are unable to conceive of an infective agent traveling through the tympanum without creating any inflammatory disturbance there, and yet setting up in the mastoid cells this disturbance only after entrance through the aditus. Such an opinion is to be regarded as reasonable but lacking in that medical imagination without which some of the best creative work in pathology and preventive medicine would have remained undone. The oropharynx and nasal cavities are normally rich in bacteria, yet how seldom, relatively, do they produce any infectious disorder, though few of us would be so radical as to deny the idiopathic feature in ordinary otitis media merely because there was no such process in the pharynx. For practical purposes the connection between the tympanum and the pharyngeal orifice of the Eustachian tube on the one hand and the tympanum and the mastoid cells on the other are quite as intimate and analogous. Moreover, it has been shown microscopically and biologically that the tubercle bacilli in passing through the faucial tonsil to set up a typical tuberculous cervical adenitis leaves rarely, if ever, any tuberculous disease in that tonsil. The analogy is a fair one to offer in support of the theory presented in this paper. According to Lévi,[1] Zaufal of Prague has demonstrated frequently in necropsies that the mastoid cells can undergo necrotic and inflammatory changes without the middle ear being involved. It is my impression that Zuckerkandl also has done this in over a hundred cases.

While the theory of infection through the blood stream is impossible of proof, it seems so reasonable to Chauveau[2] that he reports four cases with that etiology, and de Santalo[3] supports both theories of infection with considerable force. However, while I see nothing to make the hematogenous theory of infection unworthy of acceptance, it is but fair to state that it is generally believed by those who concede an entity to idiopathic mastoiditis that the causative organism begins its journey in the oropharynx, proceeds through the tube to the tympanum without finding conditions favorable for growth or without having been virile up to that time, and finally arrives in the mastoid cells by way of the aditus. Here, the blood supply being poor and the cavity practically a closed one, the conditions are ideal for its suppurative activity. The rapidly ensuing tumefaction of the mucoperiosteal lining of the antrum, whose power of distention can be fairly stated to be enormous, renders the cavity a true closed cavity, as it causes the lining of the aditus to swell, completely closing this sole entrance into the antrum. With a truth more apparent than real, it is asserted that the inflammation of the tympanum may be so slight and transient as to escape notice and lead to the erroneous belief that none existed, but it seems impossible for any inflammation to exist in the middle ear without causing one or more of the following symptoms, which would be noticed by the patient or by those about him. I refer to pain, discomfort, "fulness in the ear," tinnitus, autophony and impaired hearing, slight but perceptible. However, the most convincing argument as to the possibility of the infection of the mastoid by the blood stream is furnished by a study of osteomyelitis, which attacks bone of the same kind as the mastoid apophysis. It is undisputed, I take it, that the cause of osteomyelitis is, as a rule, some infective organism, but, as Adami[4] puts it, "the causal agents reach the affected part either directly or through the blood stream." There can be no evading the issue made by this statement, nor that raised by the additional broad doctrine that "inflammation of bone may be brought about by local or systemic causes." Thus, it would appear that the

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

1. Lévi: Cong. Internat. d'Otol. et de Laryng., 1889, p. 33.
2. Chauveau, C.: Arch. Intern. de Laryng., 1906; de Santalo, ibid., January-February, 1913.
3. De Santalo, A. M.: Bol. d. Laryng., January-March, 1913, p. 45.
4. Adami and Nicholls: Principles of Pathology, 1910, ii, 1020.

hematogenous theory of mastoid disease rests on sound, scientific authority.

Pierce[5] reports a case of true primary mastoiditis, though the hearing tests he uses might well obscure the validity of his claim as to the primary element. However, his feeling that the absence of pus in the middle ear establishes his case cannot be accepted as good ground for his belief in the particular instance cited, either by the definition which guides this paper, or by any other scientific standard of accuracy. The existence of a serous exudate, or of the catarrhal inflammation normally preceding this transudation should act as a bar to the classification of the accompanying mastoid infection as a primary inflammatory process, as either is but the initial stage of the infective condition. It is exceedingly doubtful if any otitis media, or any mastoiditis, is ever purulent from the very beginning, as it is pathologically impossible to conceive of the elimination here of the first stage of catarrhal inflammation. Brief though this be, it must be accepted as occurring; consequently, anything that suggests inflammatory invasion of the tympanum, even so slight as a congestion of the membrani tympani, should be held a good reason to exclude the primary, or idiopathic, element, from any mastoid abscess that may ensue. Such is the principle on which the accompanying table of cases has been prepared, and will account for the exclusion of many reports. Thus, one of Greenstreet's two cases at best could never attain to a better position than the doubtful column (I have rejected it), as there was a marked "sagging of the membranous canal," ten days after a heavy feeling in the head. Apparently there was a tubotympanic infection and attic involvement, even though the drum was normal. The trauma accompanying two efforts to remove a jaw tooth, in the process of which it was broken, and the gum lacerated, would appear to have set free infective material which gained the mastoid in a case reported by Humblet.[6] While the antrum showed no secretion, yet the mastoid cells were soft and friable, though it required three operations to lay bare the true cause of the patient's chief complaints, tinnitus, nausea and vertigo, a serous labyrinthitis. De Stella[7] reports a similar case, in which two teeth were drawn with mastoiditis following. He mentions von Anrooy's case of primary mastoiditis due to a cow's kick. I have not been able to verify it in the literature.

In reviewing the cases he had seen reported, de Santalo[8] feels compelled to cast doubt on the primary nature of the infection in two of the four cases reported by Labarre, in which opinion I concur fully. He reports lucidly a true case of his own, and the paper is in its entirety a valuable, well-written contribution to the literature. He subscribes fully to the belief that the route of infection is by way of the tube and tympanum. An intermittently suppurative middle ear causes the rejection of Constantin's[9] case, and Collinet[10] admits that there was probably an acute infection of the middle ear preceding the development of the mastoid abscess in his patient, while Guimani's[11] history leads to the unavoidable conclusion that there was a low-grade inflammation of the tympanum just before the mastoid complication. Scrutiny of the histories of many of these reports induces the reflection that they are frequently misleading and inadequate, though without any such intention, I feel sure. The omission of so slight a symptom as tinnitus, or slightly impaired hearing, would make all the difference between exclusion and inclusion of the case in the list of idiopathic mastoid abscesses. However, an otologist who reports inaccurately and loosely a disorder in which the minutiae of history constitute an indispensable means of differential diagnosis must suffer the penalty of having the claims of his case rejected in such an investigation as this.

The cases of Toubert,[12] Ayres,[13] Krepuska[14] and those in the North London or University College Medical Reports[15] do not conform to the definition of true idiopathic mastoiditis, as they severally are complicated by tinnitus, deafness, otorrhea of recent origin or suppurative chondritis of the cartilaginous canal. Fulton,[16] in reporting two cases (only one of which is a true one) says all primary cases are not necessarily suppurative. In attempting to substantiate this statement he gives the history of a case which showed no pus at operation. However, accepting the history entirely as given by him, his case was one which we have come to designate as a "hysterical mastoid," inasmuch as the pain was the only symptom and this disappeared, after the operation, which showed not only no pus in the entire process, but absolutely no disease of any sort. The cells were dry, and the antrum also. Snydacker[17] attempts to shed some doubt on the validity of Dunn's[18] claims in the presentation of his case, basing his belief on the presence of an influenza and tonsillitis with a serous discharge in or about the pharyngeal orifice of the tube. However, the case is a good example of this rare condition, none the less. While confessing that he has never seen a patient suffering from a primary infection of the mastoid apophysis, limited to the cells there, Heiman[19] in an able treatise assigns to cold, rheumatism, syphilis and trauma the rôle of causation in what he terms periostitis of the mastoid process.

This leads to the consideration of a series of cases called by the early observers primary periostitis of the mastoid, all of which seem properly to belong to the class of mastoid abscess under discussion here, though the histories do not justify any dogmatic assertion on this point. In 1879 Webster reported three cases of this sort in Agnew's[20] clinic, one of which was bilateral, and thought his report was the first. However, I have found that Pierce[5] in 1875 and Knapp[21] in 1876 each made similar reports. Despite his designation of the disease as a periostitis, it is interesting to note that he gives the cause as some pyogenic organism from the oropharynx which has made its way through the tube into the tympanum and mastoid. Burnett[22] in 1880 was followed by Williams[23] in 1884 in the reporting of a case, but Gruening's[24] case showed a well-marked acute middle-ear involvement, and must be classed not

5. Pierce, F. M.: Lancet, London, 1875, i, 11.
6. Humblet: Le Larynx, May, 1913, p. 136.
7. De Stella, H.: Le Larynx, April, 1913, p. 97.
8. De Santalo, A. M.: Arch. internat. de laryng., January-February, 1913, p. 104.
9. Constantin: Quoted by de Santalo, Note 8.
10. Collinet, P.: Bull. de laryng., otol. et rhinol., August, 1905, viii, 213.
11. Guimani: Ann. d. Laryng., November, 1908.
12. Toubert, J.: Arch. internat. de laryng., 1900, xiii, 384.
13. Ayres, S. C.: Arch. Otol., 1890, xix, 95.
14. Krepuska, G.: Orvosi hetil., 1898, xlii, 309.
15. North London or University College Hosp. Rep., 1889, p. 36.
16. Fulton, J. F.: Tr. Ninth Internat. Med. Cong., 1887, iii, 825.
17. Snydacker, E. F.: Arch. Otol., 1902, xxxi, 378.
18. Dunn, J.: Arch. Otol., 1902, xxxi, 178.
19. Heiman, T.: Internat. Otol. Cong., 1899, Lond., 1900, vi, 208.
20. Agnew, C. R., and Webster, D.: Arch. Otol., 1879, p. 68.
21. Knapp, H.: Cong. Internat. Otol. Soc., September, 1876, p. 80.
22. Burnett, S. M.: Arch. Otol., 1880, ix.
23. Williams, C.: Arch. Otol., 1884, xiii, 22.
24. Gruening, E.: Med. Rec., New York, 1881, xix, 634.

primary. These seven cases are especially interesting, not only from the fact that one was reported forty years ago, but also by reason of the notable advance made in the treatment and in the surgery of the mastoid. They were all subjected to the Wilde incision, some lightly curetted, with the fatal preliminary of hot applications. The fact that healing took place, and that deafness is not recorded would seem to exclude the middle ear from participation in the process! The invariable presence of a subperiosteal collection of pus, and the absence of any pus in the tympanum led to the inference in the experience of these investigators that they had to deal with periosteal disease alone. It is interesting to recall that the history of osteomyelitis, in its surgical treatment especially, is much the same, as the operators used to content themselves with cutting down on the abscess under the periosteum and evacuating it, which is another analogy existing between the two diseases.

CASES REPORTED AS OF PRIMARY MASTOIDITIS AND PERIOSTITIS; TRUE CASES AND REASONS FOR REJECTION OF SPURIOUS *

Author	Reference	No. Cases	Spurious	Cause of Rejection	Remarks
Greenstreet, A. G.	Northwest Med., September, 1913.	2	1	Suppur. chondritis	"Sagging of membranous canal," that is, attic infection.
Humblet	Le Larynx., May, 1913, p. 136	1			Hematogenous, probably from broken tooth.
De Santalo, A. M.	Arch. internat. de. laryng., January-February, 1913, p. 104.	1			Tubotympanic infection.
Labarre, E.	Presse Oto-Laryng., March, 1905.	4	2	Otitis media, chondritic abscess	
Labarre, E.	Presse Oto-Laryng., September, 1912, p. 401.	2			1. Diabetes, double pneumonia preceding (hematogenous?). 2. Little pus in antrum. Perisinus pus.
Constantin	Quoted by de Santalo, Arch. de Laryng., Jan.-Feb., 1908.	1	1	Otitis media, periosteal abscess	
Collinet, P.	Bull. de laryng., otol. et rhinol., 1905, viii, 211.			Otitis media, periosteal abscess	
Guimani	Ann. de Laryng., Nov., 1908.	1	1	Otitis media, chondritic abscess	
Jacob, E.	Rev. hebd. de laryng., 1909, iii, 46.	1	1	Otitis media, chondritic abscess	
Chauveau, O.	Arch. internat. de laryng., 1906, No. 5.	4			Regarded by author as hematogenous.
De Stella, H.	Le Larynx, April, 1913, p. 97.	2	1		Influenzal otitis; author admits mastoiditis without otorrhea to be better designation.
Halasz, H.	Monatschr. f. Ohrenh., 1904, xxxvii, 354.	1			
Candela, A.	Bol. de Laring., July-December, 1912, p. 216.	2	(Doubtful)	Otitis media, chondritic abscess (?).	No perforation of membrana tympani, but history suggestive of middle-ear infection.
Toubert, J.	Arch. internat. de laryng., 1900, xiii, 384.	2	2	1. Otitis media, chondritic abscess; deafness, tinnitus. chondritis of canal. 2. Otitis media, chondritic abscess.	
Luc, H.	Ann. d. mal de l'Oreille, 1900, xxvi, 375.	2	2	Otitis media, chondritic abscess, influenza.	"Subperiosteal abscess not due to caries of mastoid beneath."
Brieger, O.	Cong. Internat. d'Otol., 1895, p. 73.	1			
Ayres, S. C.	Arch. Otol., 1890, xix, 95.	2	2	1. Injection of membrana tympani. 2. Otorrhea recent.	
Schwarcz, E.	Orvosi hetilap, 1899, xliii, 407.	1	(Doubtful)	Otitis media, chondritic abscess (?).	
Rickets, J. V.	Lancet-Clinic, 1892, New Series, xxix, 112.	1			
Lubet-Barton	Arch. internat. de laryng., 1896, ix, 179.	6	5	1. Deafness. 2. Schrapnell's membrane bulging. 3. Deafness. 4. Deafness, tinnitus. 5. Deafness.	1. Also acute follic. tonsillitis. 2. Influenza. 5. Influenza. 6. True case; "periostitis."
Webster, D.	Arch. Otol., 1879, p. 68.	3			One bilateral; "periostitis." Author believes in tubotympanic route of infection.
Pierce, F. M.	Lancet, London, 1875, i, 11.	1			Periostitis.
Williams, C.	Arch. Otol., 1880, ix.	1			Periostitis.
Gruening, E.	Med. Rec., 1881, xix, 634.	1	1	Otitis media, chondritic abscess	Periostitis.
Knapp, H.	Cong. Internat. Otol. Soc., September, 1876, p. 80.	1			Periostitis. Bilateral.
Burnett, S. M.	Arch. Otol., 1880, iv.	1			Periostitis.
Bonner, H., and Dutrow, H. V.	Laryngoscope, April, 1915, p. 244.	1	1	Redness of drum membrane; fulness and dull pain in ear. Later, noises in ear; sagging of posterior superior wall of external auditory canal.	Involvement of middle ear apparent from the very first. Not the slightest claim to primary origin.
		Total 47			

* Of the forty-seven cases reported, twenty-four were true, twenty-one spurious and two doubtful.

REPORT OF CASES

CASE 1.—L. G. W. G., aged 9, of good physique, had a family history negative for tuberculosis and syphilis. When first seen, June 27, 1913, the auricle was observed to be prominent, the skin over the mastoid soft, edematous and of a dusky red, painful on pressure only. Temperature 99. While the drum was normal in every way, it was incised and showed that nothing was in the tympanum. There had been no deafness, no tinnitus, nothing abnormal about the ear, except the swelling behind the auricle, for which alone relief was sought. As he was an only son, hardly ever out of his parents' sight and his every whim humored, it is reasonable to suppose that his failure to mention any trouble was due to its lack of existence. On operation, done that night, the entire mastoid was found to be softened and the antrum full of pus, which gushed out on incision into the periosteum. The next morning he got out of bed, four hours after operation, and was highly indignant at being kept in the hospital for several days. His temperature was never higher than 98.8 while there. The middle ear, in spite of being incised, never discharged, and healed in four days, and he never complained of the slightest discomfort, save the soreness over the mastoid attachment of the sternomastoid muscle, severed at operation. The wound healed firmly and the patient was discharged July 26, less than a month afther operation.

These facts are mentioned as showing one of the characteristics of these cases.

Case 2.—J. H. M., aged 4½, of poor physique, anemic, had a family history negative for syphilis and tuberculosis. The patient was first seen May 6, 1914, when he came to secure relief for great pain over the side of the head, which he had had for several days. His temperature was 99. There was no deafness; the drum was normal; when incised, no secretion was found. Pain was the only symptom, except edema over the mastoid, which had been marked for two or three days. Operation, done that afternoon, revealed a subperiosteal abscess, extensive disease of the mastoid cells and frank pus throughout the bone. The wound was healed June 4, again less than a month after operation. At no time was the drum inflamed, nor was there ever any discharge from the middle ear.

The following features are common to all the true cases of idiopathic mastoiditis, and are not consistently present in other forms of the disease: (1) rapidity of convalescence; (2) occurrence of subperiosteal abscess, or exaggerated edema, generally the former; (3) freedom from absorption results, such as malaise, fever (all had less than 99.8), sepsis. This is especially remarkable, as the pus was resting in the soft parts, and not confined exclusively in bony walls.

CONCLUSIONS

It seems, to recapitulate, that the analogies of osteomyelitis and metastatic processes justify the conclusion of hematogenous origin in some cases of idiopathic mastoiditis, and that the passage of pyogenic organisms through one tissue, where they cause no ill effects, into another contiguous structure, where they do cause disease, similarly establishes the claim of entity in opposition to those who cannot grasp the tubotympanic origin of infection; so much for the theoretic considerations of etiology and entity. Again, the stubborn clinical facts I have endeavored to set forth convincingly, as there can be no other reasonable explanation of my two cases, which were peculiarly susceptible of close watch and study of the prodromal signs. In fact, the cases cited of other authors cannot be denied, though it has not been feasible to give all the histories in detail. The accompanying table shows that out of the reports of some 36 observers 47 cases were reported, but only 24 could meet the requirements of my definition, while 2 were doubtful and 21 certainly spurious. My own two cases would make the total of reported cases 26.

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INDICATIONS FOR MASTOID OPERATIONS AS SHOWN IN ONE HUNDRED CASES *

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The indications on which I rely for operative interference have been based on surgical principles, coupled with laboratory findings.

Bacteriology, a knowledge of the original infection, is undoubtedly of value, but the broad experience of clinical observation demonstrates that dogmatic rules for interpreting the meaning of one or the other bacteriologic factor are bad. There is no attempt to belittle bacteriology, but the best conclusions are drawn with a full knowledge not only of their value, but also of their limitations.

The types of infections are as follows: Streptococci, 50 per cent.; *Staphylococcus aureus* or *albus*, 14 per cent.; pneumococcus, 14 per cent.; *Streptococcus mucosus*, 10 per cent., and the remaining 12 per cent. divided between the proteus group, colon group, diphtheritic bacillus, anaerobic organisms and unidentified bacteria. Twenty per cent. show mixed infections.

Some infections are more prone to produce complications than others. In order of frequency they are the streptococcus, *Streptococcus mucosus* and staphylococcus. The pneumococci very rarely produce complications.

The laboratory findings are of secondary importance in my estimation. Many surgeons of today will depend on one thing or another to turn up, and if present, an operation is imperative.

I was called one night recently to do a mastoid operation. The leukocyte count was 22,000, with an acute otitis of twenty-four hours' duration. The more reliable indications for operative interference were not present, and the following day, everything had subsided.

With an increasing leukocyte count and other symptoms going hand in hand, one is, of course, warranted in going ahead. There are other conditions, however, with associated symptoms; symptoms that will always be present.

Professor Politzer used to say, "Never operate on a single indication; you must have two or more." Many times this has been the deciding factor not to operate.

My ordinary procedure for a mastoiditis of a few days' duration, is the following: free incision of the drum membrane; hot, wet 1:3,000 mercuric chlorid pack, moistened and kept hot for twenty-four hours. The patient must be at least partially relieved of the symptoms (lowered temperature, less pain over, or about, the mastoid region, and above all, less bulging of the posterior, superior wall).

This picture, with an increasing leukocyte count, would not disturb me in the least, but would call for close observation.

If at any time, during the course of this acute mastoiditis, there is an increase in pain, temperature, or tenderness, with an increase in the size of the bulging of the posterior, superior wall and a diminution in the leukocyte count, operation is the safest and most logical procedure.

I am not at all in sympathy with a second incision of the drum membrane. It must be borne in mind that it is not the partially healed incision with retention that accounts for the increase of the symptoms spoken of before, but it is the increased tension put on the individual cells of the mastoid that are overfilled with pus which, from mechanical hindrance, produces the pain, and the increased infection produces the temperature. At times, the temperature will not be increased.

We have, however, a symptom that is more constant and reliable than all others and that is the bulging of the posterior, superior wall, and when this is present, coupled with one or more of the other symptoms, it is proof positive that an operation is indicated, regardless of the laboratory findings.

There are many who do not concur in this and I know full well that in some of the cases the patients

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will recover without operative interference. At the same time, some will pass beyond control and I ask the question, is it not pitiful to have a child besieging you to do something for him in the midst of an active meningitis? If one has been so unfortunate as to have had such a case, I am sure the picture is very vivid. I mean that it is much safer to operate when there is any question of doubt. This delay of twenty-four hours has cost many lives; not only in ear surgery, but in all kinds of acute conditions, such as appendicitis, etc.

There is an operative indication that is overlooked by many and I wish to lay particular stress on it, and that is a pulsating otitis of three weeks' duration. Such a case will always show bulging of the posterior, superior wall, and may, or may not include pain over the mastoid region. Also, pain on pressure over the mastoid region may not be present.

There is still another very insidious infection, that from the *Streptococcus mucosus*. As a rule, this does not produce a sharp, acute infection. The patients have little or no elevation of temperature; a small amount of pain, or no pain—it seems as though the patient might recover within a few days. But it appears the same at the expiration of the few days. They are the forerunners of the more serious complications and must be watched very carefully.

There is another indication for operative interference that is very important, and as I was the first to speak of it some six years ago, I wish again to emphasize it, and that is, that an acute discharge from the ear should not be allowed to continue for more than six or eight weeks at the utmost, because the hearing will more than likely be impaired. Take it for oneself, or one's children, if there is any danger of a permanent impairment of hearing, would it not be better to operate and secure a good ear?

If one stops to reason, in a given case in which one has done an acute mastoid operation, as to why the hearing was so much impaired, it will undoubtedly be found to have resulted because the operation was delayed under the guise of conservative surgery.

Again, if such cases were attended to, we would not have the chronic, suppurative otitis to deal with. This will come some day; but I am convinced that in this community, the chronic cases are accumulating more rapidly than they are being cured by operation.

My assertions may be very dogmatic, but they are meant to be, because they are based on one hundred or more operations, without mortality.

It is in such a series of cases that we can form some conclusions; first, in regard to indications for operation, outcome of the operated cases and many things that are most important.

UNUSUAL COMPLICATIONS

In three cases of multiple furunculosis, that were operated for acute mastoiditis, I exhausted all the means at my command, with the exception of the Roentgen ray, to make a correct diagnosis.

The last patient had a *Streptococcus mucosus* infection, as well, and was under observation for some six or eight weeks. I have seen the same mistake made in Vienna, Berlin and Halle.

Had I used the Roentgen ray in the diagnosis of these cases, the mistake would not have been made. But I am not in sympathy with this particular form of diagnosis for the following reasons: as soon as the mastoid cells contain pus they will show it by comparison, and many such cases will terminate in recovery. In the cases of furunculosis, the finding would have been negative.

Many ear surgeons will say that the kind of a mastoid one has to deal with, the position of the sinus and the presence or absence of zygomatic cells can be seen from the picture. These latter conditions are of no particular importance to a careful surgeon and should not be considered so.

Ingersoll of Cleveland thinks that in due course of time we shall be able to locate brain abscess by the Roentgen ray and it would aid materially in many a difficult diagnosis.

One patient with hemorrhagic mastoiditis, with facial paralysis from no discoverable reason, made a good recovery. The facial paralysis remained. The patient died of sarcoma of the brain, some months later.

Facial paralysis is unusually rare in acute mastoiditis. I have observed three cases. In one case, it made its appearance the first day of the purulent otitis.

In one case of facial paralysis, induced by operative procedure, the patient had been operated on before by a general surgeon and had a large, pneumatic mastoid with cells extending to the stylomastoid foramen. It was at this place that the nerve was injured with a burr. This is the only case of facial paralysis that I have had in my entire work in mastoid surgery.

One patient, less than a year old, with a fistula of the outer canthus of the eye and purulent discharge from the ear, had facial paralysis and had been operated on three times by others. The antrum had been opened. By opening the antrum and establishing free connection with the tympanic cavity, recovery took place in a short time.

Of repeated acute mastoid operations and radicals, there were five cases.

CASE 1.—A boy, aged 10, had typhoid fever with double pneumonia. An acute mastoid operation was imperative. As time was an important factor, the operation was not so complete as it should have been. In this case, reoperated to the best of my ability, healing would not occur. A radical mastoid was later done, and was followed by a serous labyrinthitis, but the patient made a good recovery.

CASE 2.—S. C., a boy, aged 3, had an acute mastoiditis of a few days duration with early operation. Three months afterward he began to complain of pain on this side of the head. The discharge of pus continued. The acute operation was again done, but the patient did not recover, and had the radical operation, some six months afterward. He made a slow recovery, as regards the discharge. He hears a whisper at 25 feet.

CASE 3.—J. S., a boy, aged 7, had acute otitis and mastoiditis of a few days duration. Operation was early. The patient made a good recovery in the usual course of time. One year after the acute otitis, there was a bulging of the old scar. This subsided for a short time, when it bulged again and was exquisitely sensitive. At operation, I found a cholesteatomatous mass, and completed the work by a radical mastoid. Good hearing has resulted; 25 feet for a whisper.

CASE 4.—Evalyn, aged 2, had double acute otitis and mastoiditis, following scarlet fever. Operation was reasonably early. After treatment for three months, both ears continued to discharge, so both were reoperated. Convalescence was protracted. Her hearing is apparently good. There are no marks on the drum membrane of either ear.

To sum up, there were five reoperations. Of these, three patients had to have the radical operation before they were entirely well.

Nine cases were of fracture of the base of the skull, followed by acute otitis. Of these, three patients had to have the acute mastoid operation; one had a sinus thrombosis.

In this unusual complication, operate at the earliest possible moment, as there is already a direct communication to the skull cavity, with possible injury of the dura mater.

In a chronic, suppurative otitis media, operate at once and without symptoms for operation, for obvious reasons.

In three cases of pneumonia recovery was complicated.

Case 5.—A boy, aged 12, had typhoid. Reoperation was necessary and finally a radical mastoid operation was done.

Case 6.—A boy, aged 12, had an ether pneumonia.

Case 7.—A girl, under 1 year, had double pneumonia, resulting in death. This child had a pint of pus under the periosteum about the ear. The circulation was so disturbed by the neglected mastoid, that the ear was about to drop from the head at the expiration of four or five days, when the child died. This is the only death and the operation had nothing to do with it.

Two cases of erysipelas occurred; they were of no particular interest, except that one was under treatment for some two months before the discharge entirely ceased.

For some three or four years, I have not had to reoperate. I have improved my technic, the improvement lying in a most careful search for every individual cell that will in the least resist a fine, hooked probe. The cavity must be smooth everywhere. Hard bone must be encountered, or the dura, or sinus uncovered, before my operation is complete. This has occurred more than half a dozen times in consultation, when there was only slight pain remaining in the mastoid and a slight elevation of temperature. I cannot urge it too strongly.

I have operated in twelve cases of chronic, suppurative otitis media, by the so-called acute operation. They were all clinical cases, and in children from 7 to 14 years of age. All the patients but one are well and have good hearing. Some of the perforations in the drum membrane healed, others did not.

The only contraindications in the cases have been vertigo, cholesteatoma and destruction of the bony, tympanic wall.

In four of the cases an acute exacerbation of the chronic suppuration occurred, accompanied by the usual symptoms.

The reason for doing this is the following: Schwartze was the first to do this acute operation and remove the cancellous tissue until hard bone was encountered. Many of the patients recovered, some did not. Then Stacke tried to improve this by operation from within the meatus, enlarging from this opening, and Zaufel combined the two, producing the complete, radical mastoid operation.

Schwartze produced cures in the chronic, suppurative otitis media cases by such a procedure, and Jansen did the same operation some fifteen years ago, with a slight modification of cutting down the posterior wall to the annulus tympanicus; this procedure produced cures as well, but they were not entirely satisfactory.

Heath attempted further to modify this procedure by making an incision through the cartilaginous part of the meatus, tamponing this within the mastoid cavity and closing the posterior incision. This latter procedure, to my mind, is not so good as either of the others.

I concluded that I could do a great deal more by the simple Schwartze or the acute mastoid operation, as it is known today. In such cases, the opening into the tympanic cavity must be kept patent, until all discharge has ceased from the ear. I also irrigate with an intratympanic cannula through the perforation, as well as by the antral route. The patients are dressed daily. Irrigations of mercuric chlorid, 1:3,000, are used every second day, and as soon as the discharge from the ear stops the posterior wound is allowed to heal as rapidly as possible. Should a drop of pus come from the depths of the posterior wound, the fistula is irrigated every other day, and dressed daily, until the wound is entirely healed.

My one patient who did not recover has a partial destruction of the tympanic wall; all of these cases are slow in recovery; some of them require two months.

I am beginning to be of the opinion that every case of chronic suppurative otitis media does not need a radical mastoid operation, and that in doing operative work, it should be left to the judgment of the surgeon as to just what operative procedure is the most desirable. That is, the pathology will determine the kind of operation to be done.

BRAIN COMPLICATIONS

Of purulent meningitis, there were no cases.

Of serous meningitis, there were three cases of the lesser grades but nothing of interest to report.

Of brain abscess, there was one case; one caused by gunshot wound by way of the ear through the tegmen tympani. The abscess was evacuated; the bullet removed. The patient made a complete recovery.

Of extradural abscess, there were sixteen cases. Most of these abscesses were small, with but one exception, this being so large that I will go somewhat into detail.

Case 8.—A man, aged 45, had acute otitis of eight weeks' duration, with more or less pain most of the time, but not enough to demand serious consideration. There was indefinite pain on the whole side of the head; painful to percussion or deep pressure. The meatus was small; there was so much bulging of the posterior superior wall that the membrane could not be seen at all. The organism was the *Streptococcus mucosus*.

Pus was encountered as soon as the mastoid was opened, as nearly as could be judged, about 16 ounces. After this escaped and in taking away more bone, a granulating mass presented, filling the entire mastoid cavity.

For some time, I did not know with what I had to deal, as the mass was soft but not of the consistency of granulation tissue, with a bony foundation. At this place, I enlarged my incision, going upwards well into healthy bone, retracing my steps until I was again in the mastoid cavity, and from here uncovered granulation tissue until I encountered healthy dura.

This procedure was carried out around the entire mastoid cavity until healthy dura was uncovered. All the carious bone in front was removed.

It was found that this protruding mass was none other than the dura mater, with large granulations, in some places necrotic. Further investigation showed entire destruction of the bone of the middle fossa, as well as the sinus, extending to the petrous portion

of the temporal bone. In other words, the dura mater of this entire area, covered with granulations (as spoken of before), filled the large, pneumatic mastoid. After a few days of anxiety, the patient was out of danger.

Of sinus thrombosis, there were six cases.

CASE 9.—A man, aged 65, had acute otitis of three months duration, with a great deal of pain most of the time. The meatus was so swollen that nothing could be seen. There was no history of chills or fever. The large, pneumatic mastoid was filled with granulation tissue and pus. On further curetting away granulations, another pus cavity was encountered, which on careful examination proved to be within the sinus itself. The proximal, or distal clots were not disturbed, for various reasons. The patient made a good recovery. The infecting organism was the pneumococcus.

CASE 10.—A man, aged 25, had an acute otitis of one month's duration and complained of vertigo. There was some pain on pressure. The patient looked septic. There was no history of chills or fever. A large, pneumatic mastoid was found with granulations and pus. A sinus was accidentally uncovered, which showed a spot, the size of a 5-cent piece, that was discolored. The sinus was incised; a clot an inch long was taken from the sinus. It seemed to be regular in outline at all places. No bleeding occurred. The sinus was packed with iodoform gauze. The patient made an uneventful recovery.

CASE 11.—A man, aged 35, fractured the base of the skull three weeks ago; this was followed by a discharge from his ear that soon became purulent. This patient had a temperature of 103 when examined, but said he never had a chill. There was tenderness over this side of the head and especially of the mastoid. There was bulging of the posterior, superior wall. Operation the following day disclosed a large, pneumatic mastoid with pus and granulation tissue. The fracture could be traced across the cavity by a bloodclot. The sinus was not uncovered. The following day, the characteristic symptoms of sinus thrombosis developed, with a thrombus to the knee joint, requiring it to be opened; there was a great quantity of pus. Jugular ligation was done and the clot removed. No apparent route of communication with the sinus was observed. The infective organism was the *Streptococcus mucosus*. Convalescence was slow.

CASE 12.—An incomplete operation for acute mastoiditis, with occurrence of sinus thrombosis of probably ten days' duration. The jugular was ligated and a clot, as long as the little finger, removed. Thrombus occurred to the hip joint; this infection subsided in the course of three weeks. Convalescence was slow.

CASE 13.—A girl, aged 5, had had an acute mastoid operation eight days before, with injury of the sinus. For eight days the patient had the characteristic temperature curve. No chills were noted. The organism was the *Streptococcus mucosus*. The jugular was ligated and a clot, half as long as the little finger, was removed. There was a slow convalescence, in which a choked disk of 5 diopters developed in both eyes; also a squint of the eye on the same side. No other symptoms were present. In the course of six or eight weeks, the eyes were perfectly normal.

CASE 14.—A man, aged 35, had an acute otitis of six weeks' duration. Chills and fever were present for several days. The temperature at the time of examination was 103. The mastoid operation was done the following day. The jugular was ligated and the clot removed. Convalescence was speedy.

These cases of sinus thrombosis are not reported in full, because they have been reported in full before, with the exception of Cases 11 and 12, which will be taken up at some future time.

Of labyrinthitis, there was one case. A woman, aged 20, a nurse at the city and county hospital, had acute otitis of both ears, of ten days' duration. There was great pain, tenderness, vertigo and vomiting, with nystagmus to both sides. The temperature was 103. The meatus was so swollen that the drum membrane could not be seen.

Immediate operation was done on both ears. A large, pneumatic mastoid was disclosed with pus and granulation tissue. Convalescence was slow, the temperature falling and nystagmus diminishing from day to day.

My only reason for saying this patient had a purulent labyrinthitis on one side is that later in her convalescence I discovered that she had no hearing in one ear. The other ear was impaired as well. The drum membrane does not show signs of adhesive inflammation.

The full history of this case will be found, with a series of others, in the California *State Journal of Medicine*.[1]

The hearing has been universally good. In the great majority of cases, they never realize any difference.

The only cases that show impaired hearing are the ones that have been accompanied by more or less serious complications, or in which the mastoid operation has been so delayed that granulations have developed within the middle ear, with the formation of adhesive processes. The reason the complications were spoken of more or less in detail was to show that in the first place, in nearly all, the primary operation has been delayed. The occasional exception goes to prove the rule.

The mortality, as given by various authors, ranges from 8 to 12 per cent.

In my 106 cases, there was not a single death. Besides, these cases were taken from all walks of life, many of them neglected cases.

In conclusion, my convictions are firmer than ever in regard to the indications for operative interference; because, I have had no mortality and because the result as to hearing has been universally good. The improvement in my own technic has resulted in no necessity for reoperation in a long time.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. KYLE, DARNEY AND WELTY

DR. J. HOLINGER, Chicago: The indications for mastoid operation were laid down long ago. I would not undertake, after hearing these papers and reading a great many others, to suggest material changes. We speak here, of course, of uncomplicated mastoid cases without signs of perforation of pus into the deep parts of the neck, or involvement of labyrinth, meninges or the lateral sinus. In the first place, time is an important factor. Schwartze gives ten days as the limit in well-developed mastoid symptoms. It is poor policy to hustle the patient to the operating table at the first signs of mastoid swelling and tenderness. Even in sinus thrombosis we must not forget that we can let several attacks of fever and chills pass in order to ascertain the diagnosis before we come anywhere near a dangerous state. A colleague treated such a patient in whom he had misinterpreted the symptoms a whole winter, with three or four attacks of chills and high fever a week. The diagnosis was verified at the operation. Of course, this is an exceptional occurrence, but it shows that unless the diagnosis is absolutely certain we do not run any risks in waiting. We have to take a different standpoint than the general surgeons. It would be easy for me to mention cases in which they did harm with hasty operations. Nearly every one of our better known

1. Welty, Cullen F.: California State Jour. Med., November, 1913, p. 464.

surgeons in Chicago operates on the ears, and if we want to justify our position as specialists on these organs we have to do more careful and better work than they do. To do the best for our patients and in the easiest way must be our guide.

Much has been said about mastoiditis in general, but comparatively little about the difference in the indications for operation in acute middle ear suppurations and in chronic suppurations. It makes all the difference in the world whether or not the patient had a chronic suppuration before he had his mastoiditis. The condition in chronic suppuration is much more serious if a mastoiditis develops. Dr. Kyle says the time to operate is as soon as the diagnosis is established. This is true in many chronic suppurations, but I do not think I would approve that statement in acute inflammations of the middle ear. If Dr. Kyle has made a great many postmortems he will agree with me that he finds pus and inflammatory conditions in the mastoid in a number of cases without any symptoms during the lifetime, and therefore without any need of an operation. Professor Betzold long ago showed that pus in the mastoid can disappear without leaving any trace whatsoever. That cell obliteration in the mastoid is a regular consequence of mastoid disease is at least very questionable. There is a possibility in old chronic suppurations, but no regularity. Allow me to illustrate a few of the points I brought forth by mentioning some cases: First, a case that gave me a great deal of difficulty, where I had to take a stand against four colleagues. There were many symptoms of mastoiditis, like great pain and swelling, but no signs in the middle ear. I insisted on waiting. Four or five days later the case cleared up as a case of herpes zoster. The herpes pustules appeared around the ear.

The Roentgen ray is all right if you can make use of it. Often it is too cumbersome.

Dr. Frederick E. Franchere, Sioux City, Iowa: What reason is there for handing down a decision before all the available evidence is in? It is my practice to have in every case a bacteriologic examination made of the pus from a discharging ear, also a blood count, and when possible a Roentgen-ray examination of the mastoid. Streptococcus infection seems to be the most virulent, but I have seen severe cases in which the pneumococcus was the infecting agent. My experience with the Roentgen ray to diagnose mastoiditis has not led me to put much reliance on it. As far as the leukocytosis is concerned, the blood count is of no value, as it may result from sources independent of the aural affection. However, a marked increase of the polynuclear leukocytes is of unquestioned value in establishing the diagnosis of pus in bone. We have been taught that the occurrence of mastoiditis as a complication of suppuration of the middle ear depends on two things—the severity of the infection and the powers of resistance of the patient—but I am led to believe that there is another factor influencing the termination of middle ear suppuration, namely, the size of the mastoid cells. Siebenmann shows that large cells have not the resistance to infection shown by small cells, owing to their having relatively less surface than the small cells. I have no confidence in any treatment of mastoid involvement of any degree, except surgical interference. If these cases do terminate in resolution it is because of mild infection and high powers of resistance. True, some cases seem to recover, but do we know they are well? Appendicitis used to be treated medically, but it would be interesting, if not amusing, to have some one get up before the surgical section of this society and even suggest the medical treatment of appendicitis. A man's hearing is worth something, and I firmly believe that the earlier the mastoid operation is performed, once the diagnosis of mastoiditis is established, the more conservative the operator is. If there is any reason for waiting, I have not found it. Furthermore, as in appendicitis, one never can tell what one will find within the mastoid bone until one comes to operate on it.

Dr. George F. Cott, Buffalo: Operations for acute mastoiditis are largely left to the otologist. There are two classes—those operated on by the otologist, and those by the general surgeon. In the last year I have treated three patients with mastoid infection who recovered without operation. One patient was suffering eight days with acute middle ear pain and discharge. One of the eminent men of New York City saw the patient during the state meeting at Buffalo, and advised immediate operation. I saw her the next day, and as I knew the family was neurotic I said wait. She had extreme pain, sagging of the posterior walls, pulsating middle ear. She had to be kept under morphin two nights; temperature, 102.5. I determined to wait, and finally in less than two weeks she was able to walk out without operation. There were three other patients who recovered with operation. But here is a case the other way. An old lady had an acute suppuration of the middle ear for eight days. I saw her five different times in five days. She had extreme pain over the mastoid and had to be kept under morphin. On the fifth day I recommended operation, but her son being a physician, thought they had better change physicians, and I thought afterward, it was wise too, for she recovered without operation. There was a case in which any of you would operate. I do not know what Dr. Kyle meant by the mastoid operation, whether going into the mastoid cells or taking in the antrum. When that discharge is lessened, although you have other symptoms of mastoid disease, clean it out and let the antrum alone and they will recover every time. These patients usually recover within two or three days.

Dr. Hill Hastings, Los Angeles: In talking with a good many of my confreres in southern California, I find there are certainly fewer mastoid cases now than ten years ago. I find that is the opinion of men from the East, so we cannot ascribe it to our good climate. It may be due to the better condition of nose and throat in children. They are growing up now without tonsils and adenoids, they have fewer colds and infections of the ear. Nevertheless it is due also to the fact that we do not operate as quickly as we used to. Also the general practitioner is realizing that an earache is a serious symptom, indicating incision of the drum membrane. Take an acute otitis media with mastoid involvement—and practically every severe otitis media has more or less mastoiditis—what danger is there in the condition? It is compared frequently to appendicitis. I do not think that is a fair comparison. We know these acute cases do not develop into chronic cases nearly so much as we used to believe. Chronic cases come from measles, scarlet fever and tuberculosis, rather than as a result of the usual acute otitis media resulting from an infection of the nose and throat. Then again, what danger is there that acute mastoiditis will carry the patient off before you have time to consider operative indications. They might die of meningitis, sinus thrombosis, or brain abscess. A majority of brain abscess cases and sinus thrombosis cases come from chronic otitis media cases and not from acute cases. I doubt very much whether we save the so-called "fulminating" cases from meningitis by operation. If it is an acute mastoiditis with developing meningitis, I doubt whether a mastoid operation does very much good. I did a mastoid operation on the fifth or sixth day, and the patient died of meningitis some two or three days afterward. I do not think my operation had any bearing on the case at all either for or against, but it would be hard for the people to understand that. We are bound to have some mortality. You cannot prevent this by saying "operate in every case early."

Dr. Edward C. Sewall, San Francisco: I would like to call attention to a statement of Dr. Welty with which I am not entirely in accord — a diagnostic matter. I think he made the statement that any discharge, pulsating in the fundus of the ear, after three weeks' time produced a prolapsus of the upper posterior wall. I simply wish to register my opinion contrary to that statement.

Dr. H. B. Graham, San Francisco: I want to thank Doctor Dabney for the opportunity he has given me to refute his statement that there is a primary mastoiditis. He says there is possible doubt on the part of some people, and I am one who is thoroughly convinced there is no such thing. That we

can get a hematogenous mastoiditis I think is practically impossible. Practically, I say. Theoretically, we can get it there as well as in any other part of the body, but I do not think we do get it; I think these cases are delayed inflammatory disturbances that have not been detected. I had occasion to look up the literature and hunt for a case of primary mastoiditis. In all the case reports you would find that a primary lesion had taken place. A large number of mastoid cases are delayed lesions after middle ear infection. This may occur a year and a half after the primary lesion in the middle ear. The *Streptococcus mucosus* may remain dormant for many months and produce symptoms that are very obscure and overlooked by the practitioner. They lead on with definite history to mastoiditis or brain complications and are operated on as primary mastoid cases.

DR. GEORGE W. MACKENZIE, Philadelphia: I would sooner trust my life in the hands of the good diagnostic surgeon than in the hands of the good operative surgeon. The discussion has narrowed itself down to, first, when should we operate in mastoiditis when the diagnosis is established, and second, the question of the presence or absence of mastoiditis. Concerning the last subject we may safely concede a mastoiditis to be present in the so-called typical cases, and probably the majority would operate. There is another class of cases which are atypical. In these the outer table of bone is thicker than the average; also those cases are due to infections from the capsulated cocci, where the progress of the disease is rather insidious for a time and then bursts suddenly, so to speak, as it reaches the mastoid. There are other atypical cases in which there is practically no pain at all and little swelling over the upper portion of the canal. The only symptoms manifested may be reduction of hearing, vestibular irritation, and headache, due to the infection working inward rather than outward. We may find atypical cases with the membrane intact. The cases in which the membrane is intact are apparently increasing in proportion to what we originally believed them to be. Where the membrane is intact and mastoiditis is present, there are certain typical signs. The membrane will not glisten like the normal, but will show a dull appearance similar to the cornea in cases of glaucoma. The hammer handle will appear narrow, mentioned by Alexander as characteristic of serous inflammation of the middle ear. The posterior portion of the hammer handle is obscured by the secretion. These are atypical cases, and my experience has been that these atypical cases reach tremendous magnitude before we are aware of it unless we are on the lookout for them. It is up to Doctor Kyle and others who are developing the Roentgen-ray method to push it, because if we cannot make a diagnosis in a certain class of cases in any other way, we must accept it. Concerning the time to operate, I believe as soon as we are sure that a mastoiditis is present it is time to operate, granting that there are cases that recover without operation, I doubt if a conservationist can show 100 per cent. of cures by conservatism as compared with Doctor Welty's 100 per cent. cured by surgery.

DR. JAMES A. PATTEE, Pueblo, Colo.: The discussion has trended into the question when to operate. Inasmuch as the laws guiding us in the presence of a given group of indications have been well established for a number of years, only the physician in charge, who observes the case from day to day, can decide the time of operation. In the discussion some have favored a prompt, radical course, while others advocate conservatism. For my part I am convinced that I operated too frequently ten years ago. With increased observations and experience I reduced the frequency of operations without impairing results. Whether an operator should be conservative or radical depends on so many conditions that none but the surgeon can determine. For instance, one might operate on the tenth day for a complex of symptoms and be regarded radical for his procedure, though no one would consider it so if he operated for about the same condition on the twenty-fifth day. Early in an attack a certain allowance should be made for pain, fever, flow, etc., although these symptoms should be rated at their fullest value in the third or fourth week.

DR. NORVAL H. PIERCE, Chicago: As regards the time of operating a sigmoid sinus thrombosis, there are cases that are obvious; the field is clear; there is no reason for believing that there is anything else to cause the symptoms of sepsis, and I would operate as quickly as anyone else under these circumstances. There are other cases, however, the obscure cases, which may prove to be a great bother even to the most experienced and most skillful, and these are the cases in which we should be conservative and not plunge suddenly in and operate. We should never operate on anybody unless we have a good reason for operating. If we depart from that law we will soon degenerate into quackery. The previous speaker, to my mind, stated the gist of the whole matter of operation in acute mastoiditis. If we are going to operate on every case of mastoiditis we will operate on every case of otitis media. In every case of acute otitis media there is inflammation of the mucous periosteum lining the pneumatic space within the mastoid. We know from experience what occurs in acute otitis media with infection of the mastoid. In the vast majority of cases it takes just about three or four weeks for decalcification to occur in the bone that separates one pneumatic space from another, and when that decalcification begins then the probability is all in favor of the case becoming chronic or taking a long time to recover. The chances are that this decalcification is general within the mastoid process, and then is the time to operate in practically all these cases. Therefore, the indications for mastoid operation are an inflammation, a purulent discharge coming for three weeks from the external auditory canal, whether or not there is pain or swelling over the mastoid. After the third week, we may know there is destruction of bone by softening within the mastoid. In an experience with some thousands of cases at the Illinois Eye and Ear Infirmary and elsewhere in Chicago, I can recall only one case that I operated on in the first week, and that was a case of primary thrombosis of the jugular bulb. Of course in the presence of complications one can operate at any time; but I do not believe one should often operate before the beginning of the third week.

DR. PETER A. JORDON, San José, Calif.: Forty per cent. of my small number of mastoid patients, after proper diagnosis and careful treatment, get well without operation.

DR. WENDELL C. PHILLIPS, New York: A word might be in order arising from my experience in my services at the Manhattan Eye, Ear and Throat Hospital and the Post Graduate Hospital. I have not looked up the statistics recently, but it is my impression that under the modern method of treatment of acute purulent otitis media with mastoid symptoms, the majority of cases we consider serious enough to place in a hospital bed for treatment and care get well without operation.

DR. JOHN J. KYLE, Los Angeles: I think I may claim that my knowledge of the subject of mastoid inflammation and the indications for operation is based on long experience. I am not making the mistakes today that I made ten or fifteen years ago. If I had a mastoiditis and could have the benefit of the knowledge and experience of a man like Dr. Hastings and he should tell me my case would go to recovery without operation, or should tell me the indications were for operation, I would immediately accept his conclusions. Now I am of the firm opinion that if you have a pocket of pus and the indications are such that you can operate and remove the pus without endangering the life of your patient, it is your duty to do so. We know that pus will be absorbed. We know that many cases of mastoiditis go on to spontaneous recovery, and as Dr. Hastings has mentioned, we are operating in very few cases. It would be absurd to say that every case of acute otitis media recovers without operation, but I think that a great majority, 75 per cent., do. If you have a case that shows well marked symptoms of mastoiditis, and the indications are for operation, an operation should be performed at once. The significance and the future effect of an otosclerosis is something that you and I ought to know. Many times I have had cases go to spontaneous recovery, i. e., drums completely healed, and after a month's time have the patient develop another attack of acute otitis media with mastoid abscess. The structural changes found in the mas-

told at operation must have taken place at the onset of the inflammation. I am a little surprised that the Roentgen ray has been so lightly touched on by the members who have taken part in the discussion, as it is a valuable aid to diagnosis, and it seems to me that as men progressive in our specialty, we ought to take advantage of these opportunities. We have all had many cases of mastoid abscess in which it was impossible to establish a diagnosis without the Roentgen ray. I know I have. That is, in my own mind I knew I had a mastoiditis, but it was impossible for me to convince the consultant, or oftentimes the patient or parents of the patient, that such a condition existed, and the roentgenogram would cinch the diagnosis.

Dr. Virginius Dabney, Washington, D. C.: Most of our troubles are largely matters of definition, or of opinion. I understood Dr. Graham to say that the *Streptococcus mucosus* can linger dormant for as long as eight months in the tympanum and then set up a disturbance in the mastoid; perhaps; but this would not disprove my theory at all. Moreover, if it were dormant, how would we know it was there?

Dr. Cullen F. Welty, San Francisco: With a mortality ranging from 8 to 12 per cent. in the acute mastoid operation in hospitals all over the country, does it not attract your attention when more than 100 consecutive patients have been operated on without mortality—cases that were not selected to my own liking, cases with serious complications, all of which were from delayed operative interference? All this must mean something to the one who wishes to see the best; the one who wishes to progress. Doctor Hastings spoke of losing a simple mastoid case from meningitis, saying that the operation did not have anything to do with the death. Of course, the patient would not have died had the operation not been so long delayed. Dr. Cott said he was in the habit of using morphin to quiet the pain. Such medication in acute mastoiditis is, in my opinion, almost malpractice. Dr. MacKenzie spoke of an indication for operative interference that I am very glad to second; in fact, I forgot to speak of it. Some such cases occurred in my series. Dr. Phillips demonstrated beyond question that there were not so many acute mastoid operations at present as formerly. I can verify that, but I will say that the reason lies in a wholly different cause, and that is the early removal of tonsils and adenoids. A given case of acute otitis is not so likely to cause an operative mastoiditis. All cases of acute mastoiditis are less frequent and less severe, or rather much less likely to go on to operative interference, if the tonsils and adenoids are thoroughly removed. I have only had a few cases of acute mastoiditis requiring operation in which the patients have had the tonsils and adenoids thoroughly removed. Dr. Pierce speaks of the three weeks' period. This is the old standard adopted by Professor Politzer some twenty years ago. Every year sees us a little ahead. In my paper I drew definite conclusions from a series of operated cases, and it is these deductions and observations that should be considered, rather than the report of a neglected, or I might say, conservatively treated case. I maintain that a death should not occur from an acute mastoid and its complications, providing the ear surgeon has been in attendance on the case from the early stages of the acute otitis.

Cooperation Needed.—The relationship between the various branches of child welfare work is remarkably intimate but quite often escapes observation and still oftener escapes realization by the very workers themselves. In their enthusiasm for improving conditions they forget such elementary principles as, for instance, that the periods for compulsory attendance at school, for prohibition of child labor and for public relief of children from want must be the same, and if one is extended, the others must be changed to correspond. This applies to other branches of child welfare work with equal force and shows that cooperation is essential to effective reform. Because of the absence of this essential our laws are in confusion and our work is seriously hampered.—Edward N. Clapper, *Secretary National Child Labor Committee.*

VACCINATION AGAINST TYPHOID IN THE UNITED STATES ARMY

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In view of the interest manifested by physicians, and particularly by health officers, in the prevention of typhoid fever in the United States Army by means of vaccination, the following note is presented; data covering the entire period, including the calendar year 1914, are included:

The officers who foresaw the importance of this measure to the Army and secured favorable reception of the idea in the War Department were Gen. George H. Torney, then Surgeon General, and Col. Jefferson R. Kean, Medical Corps, in charge of the Sanitary Division of the Office of the Surgeon General.

During the summer of 1908, Major Frederick F. Russell, Medical Corps, United States Army, was sent to Europe to make a study of the methods in use in England for the prevention and stamping out of typhoid fever epidemics, both in the army and among the civil population. His report and recommendations were submitted to a board of eight medical officers, of which the Surgeon General was president and Major Russell recorder. The members of the board were:

Dr. Victor C. Vaughan, dean of the Department of Medicine and Surgery, University of Michigan.

Dr. William T. Councilman, professor of pathology, Howard University, School of Medicine.

Dr. John H. Musser, professor of clinical medicine, University of Pennsylvania, School of Medicine.

Dr. Alexander Lambert, professor of clinical medicine, Cornell University Medical College, New York.

Dr. Simon Flexner, director of laboratories, Rockefeller Institute for Medical Research.

Dr. William S. Thayer, professor of clinical medicine, Johns Hopkins University Medical Department, Baltimore.

The board recommended the immediate introduction of the practical voluntary vaccination against typhoid in the Hospital Corps, Army Nurse Corps, and in any expedition of troops from the Regular Army which is ordered to take the field for active operations; and, further, that an opportunity be given to volunteers from the Army as a whole to be protected by vaccination against typhoid. The recommendations were immediately carried out.

The manufacture of vaccine in large quantities was begun at the Army Medical School, Washington, D. C. This vaccine, as described by Major Eugene R. Whitmore, Medical Corps, now in charge of the Bacteriological Laboratory, Army Medical School, Washington, D. C., is made from a "single strain of the typhoid bacillus. . . . It was chosen because tests have shown that it produces a large amount of antibodies; and it has the advantage that it gives an even emulsion when grown on agar. It seems that virulence alone is not the all important factor in the production of high and lasting immunity." The comparatively few cases of paratyphoid fever occurring annually in the Army have disinclined the makers of the vaccine to include paratyphoid strains in the vaccine, a procedure advocated by Castellani.

The vaccination of volunteers in the city of Washington was begun by March, 1909, and as the immediate results were completely satisfactory, the vaccina-

tion of the Hospital Corps and of all others who volunteered was taken up soon afterward. Considerable progress was made during the year 1909 in the campaign for the protection of the Army by means of vaccination.

VACCINATION AGAINST TYPHOID IN THE U. S. ARMY

Year	Number of Persons Vaccinated	Number Receiving Three Doses	Cases of Typhoid Fever	Army, Mean Strength
1908*.....	0	0	239	74,692
1909*, to September 1.....	830	621	282	84,077
1910*.....	16,093	11,532	198	81,434
1911†, January 1 to June 30..	27,730	25,779	70	82,802
1912†, July 1, 1911, to June 30	40,057	All	27	88,478
1913†, July 1, 1912, to June 30	25,986	All	4	90,732
1914†, July 1, 1913, to June 30	35,902	All	7	92,877

* Voluntary. † Compulsory; fiscal year.

March 6, 1911, orders for the mobilization of a division in Texas were published. The vaccination of the entire command against typhoid fever was directed, and orders were issued by the Secretary of War, March 9, 1911. The mean strength of the command was approximately 12,000. There were practically no skin infections at the site of inoculation, nor were there any alarming general reactions, and in over 90 per cent. of the cases treated the general reaction was absent or mild. The routine vaccination of all recruits was begun in June, 1911, under the authority of General Orders No. 76, War Department, June 9, 1911. Sept. 30, 1911, under General Orders No. 134, War Department, typhoid vaccination was made compulsory for all officers and enlisted men under the age of 45 years, or who had not had an attack of typhoid fever. At the end of 1911 a census of the entire Army showed that over 10,000 persons connected with the military establishment had not, at that time, been vaccinated. But it will be observed that the War Department orders mentioned above resulted in all officers and enlisted men being immunized against typhoid fever shortly after the close of the year.

For the decade 1900 to 1909 there were 3,510 cases of typhoid fever among the American troops, with an average therefore of 351 cases per annum. It will be noted in the accompanying table that there were 282 cases for the year 1909, and that in this year, to September 1, 830 individuals had received one or more doses of the typhoid vaccine, a number which, for all practical purposes, can be disregarded in the effect that it might have on reducing the frequency of typhoid in a body of men, the mean strength of which for the year was 84,077.

In the year 1910, 16,093 persons were vaccinated. One hundred and ninety-eight cases of typhoid are reported for the same year, which, it will be observed, was forty-one less than for the year 1908 before voluntary vaccination was introduced.

In 1911, January 1 to June 30, nearly 28,000 officers and enlisted men were vaccinated; a large portion of these at the maneuver division which was established in camp March 6 of that year. The routine vaccination of all recruits was begun in June, 1911, and the table shows for the years 1912, 1913 and 1914 the number of vaccinations occurring in the fiscal year which ended June 30. Sept. 30, 1911, vaccination being made compulsory as stated above, all those who were not vaccinated received the prophylactic as promptly as practicable. It should be stated that many over 45 years of age voluntarily received the vaccination. It is to be observed, then, that the striking and forceful comparison to be made is not that between the amount of typhoid in the Army in the year 1908 and in the year 1914, although this is an emphatic and convincing illustration; the real comparison is between the years 1910 and 1912. The reduction in the amount of typhoid fever from 198 to twenty-seven cases indicates the introduction of measures causing a radical change. Certainly no one familiar with the sanitary conditions existing in the Army will consider that any marked change was made in them between the end of 1910 and the end of 1912. The marked difference was that in 1910 not 12,000 out of an army of over 81,000 had received the prescribed three doses in the procedure of vaccination against typhoid. At the end of 1911 all but 10,000 of an army of over 82,000 had been vaccinated. Of

ANALYSIS OF SEVEN CASES OF TYPHOID IN THE UNITED STATES ARMY, 1914

Case	Date Enlisted	Date Taken Sick	Date Vaccinated Doses 1st	2nd	3rd	Original Diagnosis	Laboratory Findings	Previous Vaccination or Typhoid	Result of Disease	Age	Remarks
1*	Feb. 19, 1914	Feb. 26, 1914	Feb. 23	None	None	Vaccinia	None	V—No T—?	Died March 10, 1914	23	Typh. ulcer last 12" of ileum—hemorrhage
2+	Nov. 13, 1912	March 23, 1914	Nov. 13, 1912	Nov. 23, 1912	Dec. 2, 1912	Fever simple, continued	Feces positive for typhoid, April 4, Agg 1-100	V—No T—No	Duty May 10, 1914	24	
3+	March 21, 1912	June 24, 1914	March 21, 1912	April 1, 1912	Not given	Fever undetermined	Blood positive, June 26 and July 1, 1914	V—No T—?	Duty July 24, 1914	23	Soldier states sick after the 2d dose; does not recall taking 3d dose
4*	June 30, 1914	July 4, 1914	No doses given			Undetermined	None	V—No T—?	Died July 16, 1914	21	Autopsy disclosed perforation and peritonitis
5*	August 27, 1914	Sept. 11, 1914	Aug. 27, 1914	Sept. 8, 1914	Not given	Typhoid	Blood positive for typhoid, Sept. 14 (3 days)	V—No T—?	Duty Nov. 18, 1914	21	
6*	Nov. 21, 1914	Nov. 22, 1914	Nov. 21, 1914	One dose only		Bronchitis, acute catarrhal	Agglutination, 1-5,000	V—No T—?	Died Dec. 22, 1914	26	Colon alone involved
7=	June, 1909 June, 1912	Dec. 1, 1914	Sept., 1910	Volunteered. Dates unknown		Paratyphoid	Agglutination, 1-400	V—No T—?	Duty April 10, 1915	26	At Atlanta, Ga., 10 days previous to illness—no typhoid at post

Note.—(*) Indicates Recruit; (+) Private Hospital Corps; (=) Sergeant, C. A. C.; (‡) through error was not revaccinated on 2nd enlistment in 1912. Under "Previous Vaccination or Typhoid," V—Vaccination, T—Typhoid. When followed by (?) it indicates that it is unknown whether patient has had a previous attack of typhoid fever or not.
(*) Vaccination against smallpox is performed at the time the first dose of vaccination against typhoid is given.

the twenty-seven cases of typhoid reported as occurring in the Army during 1912, nineteen of these were in the persons of soldiers who had not been vaccinated against typhoid. Vaccination had not been accomplished because of duty in the field, or for other reasons that made it impracticable to reach these particular individuals. Of the eight remaining patients, who had been vaccinated, all recovered.

In 1913 four cases, and in 1914, seven cases of typhoid fever were reported. Only in two instances out of these eleven cases had the complete course of vaccination been administered. Some were recruits who were enlisted in the prodromal stage of typhoid, and in 1913 at least two of the cases of typhoid fever occurred in the persons of men who had been in the service at least two years, but who had failed, when vaccination became general, to receive it. In explanation of this it must be remembered that about 675,000 doses of the prophylactic have been administered since 1909 to July, 1914. This had been done in all parts of the world where United States troops are stationed, and under all sorts of conditions. It was necessary to evolve gradually some method of keeping the records, and it is not necessarily due to carelessness that a few soldiers have escaped being vaccinated out of the large number concerned. It is to be observed that during the years 1913 and 1914 the mean strength of the Army was between 90,000 and 93,000: this includes 5,000 native troops serving in the Philippines and Porto Rico, and the American troops stationed in these countries, in Panama, Hawaii and Alaska, as well as in the United States proper.

It is apparent, therefore, that the gradual introduction of vaccination against typhoid began to show results as soon as it was done on a scale of any size. This was by the end of 1910. In that year, with 198 cases of typhoid fever, it can hardly be stated that the disease was "practically abolished" by improved sanitation, as the antivaccinationists would have us believe. By the end of 1911, seventy cases of typhoid fever had occurred. By the end of the first quarter of 1912, practically all of the Army was vaccinated, and new men coming into the service were being vaccinated as soon as enlisted. There were twenty-seven cases to the end of that year and, as pointed out above, nineteen of these were in the persons of soldiers who had not been vaccinated against typhoid fever. When vaccination can be said to have become complete, as in 1913 and 1914, we have four and seven cases, respectively, and, as mentioned above, only two of these had had the complete course of vaccination when they were taken with typhoid fever.

The standard of sanitation maintained has not varied noticeably for some years. The only change in recent years has been a system of conservancy in camps that largely prevents flies entering the latrines and becoming conveyors of disease. But this could have affected only a small part of our troops in any year. In 1911 from 10,000 to 12,000 out of a total of 92,802 were in camps; during the last two years (1913-1914), from 12,000 to 15,000 out of a total of 92,580.

Finally, it must be remembered that the soldier comes into quite as intimate contact with civilians as he does with his comrades. He visits the homes of civilians; places of entertainment, both private and public; eats the same food and drinks from the same water and milk supply; is exposed to the same chances of infection from flies, contact, food and drink as the civilians, and, while living on a higher hygienic plane than the civilian in average circumstances in this country because of the intelligent paternal interest of the authorities, yet he contracts diseases (measles, mumps, scarlet fever, influenza and others) just as he did before, with the exception of smallpox and typhoid fever. Why are these diseases practically no longer existent among our soldiers?

Vaccination against smallpox and against typhoid fever are the active agents in banishing these diseases from armies that thoroughly and efficiently use these measures. This measure is now in use in the armies of Great Britain, France, Germany and Austria, and it is probably being used to a certain extent in the armies of Russia and Italy. It may be of interest to add that for the first six months of 1915, only *one* case of typhoid has so far been reported as occurring in the United States Army.

Office of the Surgeon General.

THE OFFICIAL RESPONSIBILITY OF THE STATE IN THE TUBERCULOSIS PROBLEM *

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The achievement which we all desire to result from our efforts in the tuberculosis campaign is the human control of this disease. Such control must apply to our whole country without demarcation of state, county or municipal lines.

Any given unit of population occupying any given territory, no matter how small the unit, that can demonstrate the accomplished control of this disease will solve the problem for the whole nation. The adaptation of this demonstration, in the ultimate control, would be but the multiplication of the equipment necessary for each additional unit of population.

Unfortunately, such a demonstration has not yet been accomplished for human tuberculosis, and we are still trying unproved methods on larger and smaller scales from many different angles by federal, state and local agencies.

Perhaps the most significant single demonstration of the control of tuberculosis has been accomplished by Bernard Bang, in cattle tuberculosis for the state of Denmark. Bang has shown conclusively two things.

1. The tubercle bacillus is not ubiquitous.

2. By control of housing conditions, removal of infected cattle, and protection of the newly born throughout life, tuberculosis in herds of cattle can be eradicated.

At the time of the federation of the American states, only such powers as concerned the whole people were vested in the federal government. No one who reads of the early struggle of the powerless first assembly in its endeavor to gain a foothold against the opposing greed of "states' rights," and the gradual solution of this mass of opposition by the skill of Hamilton and

* Delivered before the National Association for the Study and Prevention of Tuberculosis, Seattle, June 15, 1915.

the honesty of Washington, and compares this with the Washington of today can close his eyes to the singular development of a central government whose authority transcends that of any other earthly power. A century of evolution has given us a federated system of control of which we grow increasingly proud. Even yet, however, there appears again and again that slippery chute, called "states' rights" on which our ablest agents of government start their downward course to oblivion.

Even as the struggle for central power in the matter of army, navy and taxation took years of evolution, in gathering and dispensing education, to accomplish the present condition, so the struggle for central power in the matter of the uniform health and welfare of the American populace must take years to establish. Owing, however, to greater ease of rapid education, and greater opportunity for study, our progress in this direction is more gratifying. Only last month, however, did the state of New York reach a stage of enlightenment sufficient to see the gain of passing the port of New York over to federal control.

If, in measuring the importance of federal duties, we ask ourselves what most concerns the welfare of the whole people, the uniform answer is naturally the nation's health. Without health there can be no permanent wealth or law or war. While responsibility for securing the health of the nation may be apportioned out to the various governmental agencies, the central government must be at least responsible for the promulgation and application of uniform methods of control.

Applying this conception of federal duty to the tuberculosis problem, we are struck at once with certain phases of the question which are frequently unthought of, but no less necessary to consider, in drafting a general federal scheme. These are:

1. The malady is universal in man and beast, and may possibly be transferred from one to the other.

2. The disease is a hidden one. It is almost impossible to pick out the tuberculous sufferer. In his earlier stage his morning pulmonary toilet removes the marks of his malady for the day, and when the far-advanced consumptives by rest and care take on the appearance of health, it is especially difficult to spot the disease.

3. Tuberculosis is closely associated with all the social problems of housing, food, wages, rest, clothing and insurance, and can in no way be separated from them.

4. So long as intercity, interstate and international modes of travel carry daily in commerce clothing, food, animal and human sources of infection across the borders of cities, states and countries, we are forced in matters of control to higher and higher courts of appeal and centralization of power, till at last the federal and international courts are reached.

What, then, is the duty of the federal government? I would suggest that its first duty is to prove in one of the territories under its wardship what constitutes a proper system of control. As a first test it might determine if the principles of the Bang systems are applicable to the human race.

An intensive experiment of this sort would follow some such lines as this:

1. A tuberculin skin test of all members of the unit.

2. A clinical examination (physical and laboratory) of all reacting cases.

3. The segregation of all open cases.

4. A careful study of housing conditions.

5. A disinfection by paint and scrubbing of all infected quarters.

6. The establishment and maintenance of proper living conditions, including supervision of food, air, clothing worn and rest of all nonreacting cases.

7. Control of all food supply, especially the pasteurization of all food supplies from cattle, hogs and fowls.

8. Periodic tuberculin tests and subsequent segregation of reactors, and so on.

The federal government had no hesitation in establishing a similar precedent for other diseases under Gorgas in Panama, or for many animal diseases offering menace to the whole country. If it were once known positively what to do, the work of state governments and their divisions would be simple, and the present squandering of large appropriations secured by political and sentimental endeavor would be ended.

The federal government is in a modest way gradually accepting its privilege in this as in other problems of public welfare. A recent investigation in California and North Carolina on tuberculosis and in Johnstown on babies' welfare exemplifies its activities.

Many states and their divisions have already gathered a wealth of knowledge as a basis for this work. The Wisconsin studies of rural districts, the Pittsburgh Tuberculosis League work on babies, and the Phipps Institute work on trades are a few of the many tasks undertaken by private agencies; but no voluntary agency can secure anything like the freedom of the federal authority in legal or monetary resources.

Returning to the state's relation to this problem, we find that two fairly definite plans are followed:

Pennsylvania is the most prominent example of the first plan in which the state undertakes to build central sanatoriums and establish local dispensaries throughout the state, bearing the expense of the whole undertaking by state tax. This seems to me wrong in principle, as tuberculosis is essentially a local housing problem, requiring local intensive work, and cannot be handled by institutions of control in distant centers; and further, we are not yet sure enough of our methods to justify wholesale expenditure on this scale for a larger state.

Massachusetts, New York and New Jersey are examples of the second plan, by which the state in more or less mandatory laws places the burden for management on its local agents of legal control, the counties and municipalities, subsidizing its agents on the basis of a proportion of the per capita expense. This plan comes nearer the economic basis for handling such universal problems of public welfare. In both state plans, however, there are several fundamental weaknesses:

1. While controlling the license to practice of the medical and nursing profession, all the states have failed to realize that the control of tuberculosis cannot be handled without the proper education of these two professions in this disease. While teaching hospitals and medical schools have excluded tuberculosis from their practical work, state institutions have been placed in isolated districts and offer no opportunity to replace

this lack of training. An efficient test of the knowledge of this disease should be demanded, and to have a rightful position, it should form at least one seventh of all the knowledge of the doctors and nurses.

2. States have persistently attempted to separate tuberculosis from other social problems, against all the evidence that this can in no sense be accomplished.

3. States have forgotten that any plan for the control of consumption must be a workable plan. No plan that neglects the laws of social and color distinction is a workable plan; and no plan that fails to enforce segregation under proper conditions in jails, orphanages, hospitals, insane asylums and other housing institutions can ever be successful.

Other faults in present state plans might be mentioned, but they are faults of ignorance which cannot be corrected at the present time.

Since none of the present plans are adequate, I would propose a plan which I suggested in 1910 in Philadelphia, and which I am yearly convinced is sound from the standpoint both of efficiency and of economy.

This plan is based on a study of our solution of a similar universal problem presented by our educational system.

Emanating from state law there is in general established in educational work a unit equipment for a unit of population. By this equipment is gained a uniform compulsory and intensive application of the law to all concerned. The money for the expense of this care is provided by state and local taxation determined largely by the density of population and the need of the community. Those who are interested in this phase of the question would do well to read Cubberly's "Problems of State and Municipal Education."

In the educational field there has gradually developed a knowledge of the equipment necessary for a given population, and this equipment has been apportioned so as to be easily accessible by those whom it is to serve. The management of these units is centered in a legally constituted governing body, which also controls the expenditure of the funds collected by taxation.

The same form of control is applicable throughout to tuberculosis and other health problems.

In the first place, our statistical studies have given us fairly accurate knowledge of where to place our equipment and of what the equipment should consist.

I should say that for each hundred thousand population there should be a hospital of 200 beds, a dispensary and an open air school. There should be fifteen nurses, of whom five are visiting social service nurses, and four or five physicians. Such an equipment might easily expand and include all public activities, child welfare, pneumonia, syphilis and other health and public welfare problems.

The expense should be borne as the educational expense is borne, and the demand made mandatory by state law.

Large centers of population would be looked on as but the multiplication of units of 100,000, and the equipment would be multiplied accordingly, just as we now multiply our school equipment. Each unit would be self-governing, but centralized in some central governing board which would establish the uniformity of the work, and the prevention of overlapping.

Dr. Goldwater, the remarkable health commissioner of New York City, acting on this suggestion, has attempted such a plan in that city, and he reports to me that it not only seems to be the solution of the health problem, but also is applicable as a solution of many of the difficulties of large city government.

There is apparently a unit of population which can be efficiently managed. When, however, we grow beyond this in number of population, we cannot accomplish our care of the population in any paternal way by increasing our equipment at some central place without working a hardship on the peripheral members of the community. This has been the system of government most followed in the past. In the future, it seems to me, the dissociation of units of equipment and the association of the heads of units will be the plan adopted in all paternal work.

The state that sees fit to establish such a principle will, it seems to me, soonest reach the land of heart's desire, and will have a machinery as elastic as the problems to be dealt with, a machinery that can grow as knowledge grows and retract or reconstruct as necessity decreases, a machinery that can be used as a teaching center for doctors, nurses and social agents; and the sooner it comes, the sooner will we see spelled on the wall the doom of our present boarding houses for sick and well consumptives, and waste of effort.

We must first know, however, the right methods, and I would suggest that federal and state authorities meet and apportion different phases of the work to each other and yearly correlate their results that we may know the sooner the efficient economic and right ways of work. This, I think, may best be done, as I suggested above, on the wards of the federal government.

May I close with the prayer of Grotius in the conclusion of his great book, "War and Peace": "May God write," he said, "these lessons—He who alone can—on the hearts of all those who have the affairs of Christendom in their hands. And may He give to those persons a mind fitted to understand and to respect rights, human and divine, and lead them to recollect always that the ministration committed to them is no less than this, that they are the Governors of Man, a creature most dear to God."

Responsibility of Physicians.—Nor has the physician been without responsibility in the distribution of the nostrum. It was he that originally ordered the "psychic antiseptics" such as alkiol, borol and glyco-thymoline. It was he that introduced mucol, runatrol, papayans Bell, resinol ointment, unguentine, antikamnia and many other such nostra. It was he that became sponsor for Buffalo, Londonderry and other Lithia waters which contain so little lithium that it would require the consumption of many gallons to get a single dose of that element and for Valentine's meat juice, which contains only 0.19 per cent. of coagulable protein, so little that it is not coagulated by heat, while real meat juice cold pressed from round or beef contains 8.56 per cent. of coagulable protein. Indeed, addressing the patent medicine advertiser, Barnum in the advertising sheet, *Printers' Ink*, said: "I opine that some physicians are of more use to draw money into the pockets of the patent medicine men than they are to help save the lives and health of their patients." The physician has listened too readily to the glib detail man, of whom Sir William Osler felt compelled to say, "he is ready to express the most emphatic opinions on questions about which the greatest masters of our art are doubtful."—W. A. Bastedo, Ph.G., M.D., in the *Druggists' Circular*, February, 1915.

BACTERIOTHERAPY IN TYPHOID FEVER *

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AND
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During the past few months there have been published a number of interesting observations dealing with the bacteriotherapy of typhoid fever, largely the result of experience gained by army sanitarians in the eastern front of the European war. (Biedl, Eggerth and Paltauf,[1] von Koránvi,[2] Ditthorn and Schulz,[3] Goldschneider and Aust,[4] Csernel and Márton,[5] Rhein,[6] and others.)

That typhoid organisms used therapeutically would shorten the course of the disease was demonstrated more than twenty years ago by Fränkel, and later Petrushky reported favorable results. Reasoning from a theoretical point of view, immunologists received the proposal with considerable skepticism, the argument being made that there could be no possible stimulation of antibodies in a patient who already had typhoid organisms circulating in his blood and infecting the body as a whole; a view that received considerable support by the work of Rumpf at the time of Fränkel's publication. The latter showed that identical results could be obtained therapeutically by means of injections of pyocyaneus vaccines, thus eliminating any possible idea of specificity.

Gradually, however, the recognition that the so-called antibodies, as estimated by the bacteriolytic and agglutinin titers, were not the all-important factors in the recovery from the infection has gained ground, largely because of the demonstration that high antibody concentrations may exist at a time when the disease process is in a very active state. Even Wright has stated that vaccine therapy at times produced favorable results in a quite nonspecific manner.

After the early experiments of Fränkel attention was directed rather toward preventive immunization as introduced through the efforts of Wright; since that time the elaboration of various vaccines such as those of Pfeiffer and Kolle, Vincent, Pescarole and Quadrone, Besredka, Ichakawa, and of Gay, have represented successive stages in the refinement of technic.

The undoubted success of the preventive efforts have so far quite overshadowed the occasional reports of the successful use of the vaccines in the actual therapy of the disease. Of these the greater number have been published in French journals. The method of injection has usually been subcutaneous. During this time, however, several Argentine clinicians, following the leadership of R. Kraus,[7] had carefully undertaken the intravenous method of injection of sensitized vaccines, with good results. Kraus noted, however, that the effect was not specific in that he obtained defervescence as well with colon bacilli, while the treatment of several cases of puerperal sepsis resulted in a temperature fall that was quite striking.

Ichakawa[8] has also reported a series of eighty-seven cases, with intravenous injection of a sensitized vaccine, resulting in an immediate and permanent recovery in fully half of the cases and considerable improvement in others. He consideres the mortality reduced by one half. Ichakawa noted that the pulse rate frequently increased after the injection and warns against the use of the vaccines in cases of cardiac collapse or in pregnancy.

The dosage used has varied considerably, from the minimum of about 50 million to a maximum of 800 million. Ditthorn and Schulz consider a dosage of from 70 to 300 million most satisfactory, corresponding to about the usual dose for the Besredka vaccine (0.5 c.c. equals 250 million).

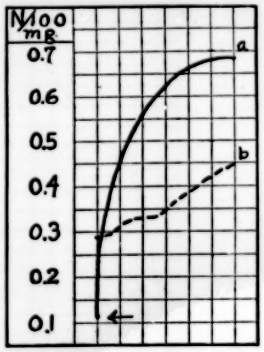

Chart 1.—Mobilization of serum proteose following intravenous injection of dried typhoid bacilli: *a*, proteose curve; *b*, curve of noncoagulable nitrogen in the serum. Arrow indicates injection of 10 mg. typhoid bacteria.

Practically all the case reports recently published have shown a result similar to that of Ichakawa, certainly justifying a most optimistic point of view as to the further development of this method of therapeutic application. There have, however, been isolated cases in which the injection of the vaccine was followed by alarming collapse symptoms, such as described by Sladek and Kotlowski.[9] They emphasize more especially the increase in peristalsis with consequent danger of hemorrhage and perforation and the cardiac collapse that may result. Even subcutaneous inoculations of immunizing doses are known to stimulate the intestinal tract, as Boyd[10] has recently pointed out.

In the endeavor to understand the mechanism which underlies the practical abortion of the disease the fact should be kept in mind that the effect is not specific, and that there have been found no immediate changes in the antibody concentration of the patient after the injection of the vaccine. There remains the possibility that the nonspecific ferments of the body are stimulated and in some way bring about the destruction of the invading organism and a detoxication. An increase in protease might produce a more rapid splitting of the toxic protein fragments to lower nontoxic forms, while an increase in the lipolytic ferments may have some influence in destroying the infecting organism itself. Whether we may ascribe primary importance to ferment changes in the serum during the course of infectious diseases is still problematic. At the time of the crisis in pneumonia a definite increase in serum protease is demonstrable, which

* From the Department of Pathology, Vanderbilt University Medical Department.

1. Biedl, Eggerth and Paltauf: Wien. klin. Wchnschr., 1915, xxviii, 175.
2. Koránvi, A. von: Wien. klin. Wchnschr., 1915, xxviii, 85.
3. Ditthorn, F., and Schulz, W.: Med. Klin., 1915, xi, 100.
4. Goldschneider and Aust: Deutsch. med. Wchnschr., 1915, No. 13.
5. Csernel, E., and Márton, A.: Wien. klin. Wchnschr., 1915, xxviii, 229.
6. Rhein, M.: München. med. Wchnschr., 1915, lxii, No. 13.
7. Kraus, R.: Wien. klin. Wchnschr., 1915, xxviii, 29. Kraus, R., and Mazza S.: Deutsch. med. Wchnschr., 1914, No. 31. Mazza, S.: Wien. klin. Wchnschr., 1915, xxviii, 64.
8. Ichakawa, S.: Ztschr. f. Immunitatsforsch., Orig., 1914, xxiii, 32.
9. Sladek, J., and Kotlowski: Wien. klin. Wchnschr., 1915, xxviii, 389.
10. Boyd, W.: Jour. Canadian Med. Assn., 1915, v, No. 5.

we are inclined to believe represents a mobilization of cellular ferments rather than an overflow from the diseased organs. Falls[11] has recently noted this by means of the usual Abderhalden technic and has extended his observations to malaria, articular rheumatism, typhoid, etc.

In experimental animals we have found that the intravenous injection of killed bacteria is followed by a mobilization of nonspecific ferments. Such an experiment is the following:

Dog 76, weight 5.5 kg., 10 mg. dried typhoid bacilli injected intravenously at 9 a. m. The animal died at 4 p. m. It will be observed from the chart that the serum protease increased from 0.11 mg. to 0.6 mg. per cubic centimeter; while the lipase titer increased from 1 c.c. hundredth normal sodium hydroxid to 7 c.c. per cubic centimeter of serum (Chart 2). There was an increase in noncoagulable nitrogen from 0.27 mg. to 0.45 mg. at 3 p. m.

Such results are of course not specific for typhoid organisms but are produced by a variety, depending to a considerable extent on the relative toxicity, bacteria which by virtue of their great resistance to proteolysis even when dried, such as the tubercle bacillus and the diphtheria bacillus, have much less effect on the serum ferments.

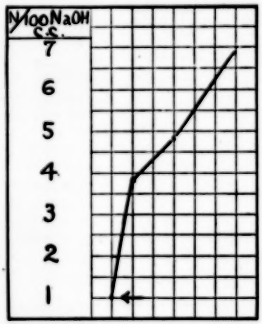

Chart 2.—Mobilization of serum lipase following injection of dried typhoid bacilli; arrow indicates injection of typhoid bacilli.

In view of certain definite objections to the vaccine treatment with typhoid bacteria, such as the increase in peristalsis and the deleterious effect on the heart, it would seem rational to endeavor to obtain the stimulation of the ferments by some means other than one involving the danger of further injury to the patient. Such a method might be found by using the various split products of the bacterium or other proteins and avoiding those which are known to be the most toxic. As Zunz, and Jobling and Strause have shown, the protoalbumose fraction of the protein split products is usually very toxic, while the secondary proteoses are practically nonpoisonous. Lüdke[12] has already made some applications of such treatment and has reported very favorable results. A series of cases which we have under treatment at present, while not sufficiently large to permit definite conclusions, seems to afford a very favorable confirmation of Lüdke's results. We shall report more fully on the series later.

We believe that the conclusion is warranted at present that intravenous bacteriotherapy offers a reasonably safe method of treatment in select cases of typhoid fever, but that further efforts should be made to overcome the definite toxic effects which of necessity accompany the injections. In the mechanism of the reaction we believe that the nonspecific ferments are of considerable importance.

11. Falls, F.: Jour. Infect. Dis., xvi, 466.
12. Lüdke, H.: Muenchen. med. Wchnschr., 1915, lxii, 321.

Education and Heart.—I am an enthusiast about education, but with all my enthusiasm, if I had to choose between the mind and the heart, I would take the heart. A good heart can take a dog's brain and make it useful.—W. J. Bryan.

PATHOLOGIC PHYSIOLOGY OF LEAD COLIC

ITS RELATION TO EXPERIMENTAL THERAPEUTICS *

ARTHUR D. HIRSCHFELDER
MINNEAPOLIS

The clinical studies of James Mackenzie and of Arthur Hertz have led us to the conclusion that intestinal cramps and colics occur when a wave of peristalsis passes down on a segment of intestine which is already in a state of tonic or spastic constriction. Such zones of spastic constriction are very often present, obliterating the lumen of the intestine and causing a stasis of intestinal contents above them. If this rule holds, it is most likely true also for the condition which gives rise to the colic in lead poisoning, and perhaps also that which causes the gastric crises of tabes dorsalis and of angina abdominis; and it would be natural to expect that any drug which relieves these conditions would also produce inhibition of intestinal peristalsis and spasm. As early as 1874, Riegel and Frank noted that lead colic was associated with increased hardness of the pulse and with changes in the pulse tracing which were characteristic of increased blood pressure. They found, moreover, that the height of the blood pressure ran parallel to the pain of the colic; and still further, that temporary relief from this could be secured by the administration of amyl nitrite. All these statements both as to blood pressure and therapy have been confirmed and reiterated by Pal of Vienna, who further adds the gastric crises of tabes and angina abdominis of arteriosclerosis to the group of cases relieved by the administration of amyl nitrite.

Although cited by Kobert in his toxicology, the recommendations of these observers seem to have been lost sight of in American literature, and received a passing mention only by Cushny. All of these observers regard lead colic as due to the rise of blood pressure, and none consider the possibility that the nitrites may act directly on the muscles or nerves of the intestines in inhibiting the peristalsis and spasm by a more direct action.

The experiments about to be described were performed on rabbits and cats. The intestinal movements were brought into view by making an incision in the midline, inserting a 10 cm. crystallizing dish and fastening the abdominal walls around this with a purse-string suture, leaving the bottom of the dish as a window through which the form and movements of the intestines could be plainly seen.[1] An intravenous injection of from 5 to 8 mg. lead acetate per kilogram of weight of the animal gave rise to intense peristalsis within five minutes, usually associated with the incidence of nodes of constriction of the bowel,

* Read before the Section on Pathology and Physiology at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

1. This method has been successfully used in England by Cushny and Dixon for observation of intestinal movements. The sides of the dish were coated with beeswax to prevent slipping.

almost obliterating the lumen; and with considerable decrease in size of the intestinal vessels and blanching of the intestinal walls. That this peristalsis could hardly be due primarily to a vascular condition was shown by the fact that the painting of the mesentery or a loop of intestine with nicotin or with atropin[2] caused paralysis of the bowel in the corresponding area, while extirpation of the thoracic spinal cord and section of both vagi failed to affect it. The peristalsis and spasm were also stopped by nicotin and atropin intravenously. These facts indicate that the lead acts primarily on the preganglionic endings of the autonomic nerves.

When amyl nitrite was inhaled or 2 drops of nitroglycerin were placed on the tongue of the animal after the lead contractions had been set up, inhibition promptly set in, lasting from one and a half to five minutes in the case of amyl nitrite; five to twenty-five minutes after nitroglycerin, and twenty-five to thirty-five minutes after sodium nitrite. The effect was most marked with amyl nitrite, slightly less with nitroglycerin and least with sodium nitrite, in exact proportion to the suddenness and duration of their effects on the circulation. Sodium nitrite reduced the intestinal movements to normal but never caused them to entirely disappear.

The relaxation of the intestinal walls is usually accompanied by a general dilatation of the large and small intestinal vessels and by the onset of a roseate hue of the intestinal walls, though, in spite of the great effect on peristalsis, the fall of blood pressure from nitroglycerin and from sodium nitrite did not exceed 12 mm. of mercury. The vasodilatation itself cannot be the responsible mechanism for the cessation of peristalsis, for if the same dilatation is brought about by placing hot water in the crystallizing dish that serves as an abdominal window, increased peristalsis sets up at once, and this also can be set at rest by administration of amyl nitrite, nitroglycerin or sodium nitrite. If the solar plexus be stimulated by a faradic current, the corresponding areas of intestines are thrown into movement as spasm, but here again, as in the previous cases, the nitrites act as inhibitors of intestinal movements.

Reviewing all these facts of intestinal inhibition, local and general, and recalling the law laid down by MacKenzie on the basis of clinical observations, that the symptom of colic is associated with intestinal peristalsis and spasm, it seems most likely that the actions ascribed to the nitrites by various writers on the relief of lead colic, tabetic crises, and angina abdominis are due not merely to the effects on the blood vessels and blood pressure, but to a different mechanism — to the rôle played by the nitrites as inhibitors of the intestines.

It is to be hoped that this experimental basis for clinical observation may lead to a wider use of these drugs, particularly in the treatment of tabetic crises and angina abdominis, and that the clinical results may bear out the hopes of the laboratory.

University of Minnesota.

2. Inhibition of experimental lead peristalsis by atropin had been demonstrated by Harnack in 1878.

Consistency is for the Dead.—Truth is progressively revealed and one must readjust himself in thought and action to the greater knowledge of truth that we ought continually to gain. The man who at 50 thinks as he thought at 30 has mentally ceased to grow.—W. C. Redfield, *Science*, July 9, 1915.

THE PINEAL GLAND IN RELATION TO SOMATIC, SEXUAL AND MENTAL DEVELOPMENT

SECOND PAPER

CAREY PRATT McCORD, M.D.
DETROIT

Current descriptions of the pineal gland attribute to this organ the function of producing a secretion which inhibits growth of body and restrains mental and sexual development from exceeding the rate looked on as normal for preadult life. This inference arises from the occasional distinctive precocity of development following invasion of the pineal gland by neoplasms. It is assumed that such neoplasms destroy the gland, and that any resulting metabolic disturbances occur from the deprivation of the body of the pineal's elaborated substances.

From a reactionary point of view, the groundwork for such a theory is both meager and unstable. From sixty-five to seventy authentic cases of pineal tumors have come under observation. These have been distributed over more than a century. Copies of the original descriptions are rarely readily accessible. By reason of faulty translations and inaccuracies in quotations, some descriptions of pineal gland syndromes have come to resemble classical myths. Of the sixty-five to seventy cases, only about 10 per cent. present those striking effects characterized as the "precocious macrogenitosomatic pineal syndrome." The instances of greatest metabolic disturbances have occurred in persons below 14 years of age. Of the total number of cases, sixteen were recognized before the age of 14 was attained — twelve boys and four girls. The syndrome has appeared in more striking form in boys than in girls, but the ironclad statement that the syndrome is confined to males is probably unwarranted. Marburg's case in a girl of 9 presents metabolic alterations equally as striking as those in boys cited as types of the pineal syndrome. It is noteworthy that the pineal syndrome has occurred only in such cases of pineal tumors as have led to an obstructive hydrocephalus and thus, of necessity, to secondary hypophysial disturbances (Cushing).

In the remaining of the total sixty-five to seventy pineal cases, there appear various departures from the established syndrome. The greater number, whether adults or children of either sex, manifest no metabolic disturbances attributable to pineal functional perversion. The nicety of the theory that only in childhood and only in boys does this syndrome appear, is apparently jeopardized by the occurrence of pineal tumors with adiposity in adults of both sexes, with adiposity and infantilism in both sexes, and with cachexia. In part, these deviations from anticipated findings are due to secondary involvement of others of the endocrinous system, notably the hypophysis. The interrelation with others of the glandular system has been emphasized by Marburg, Fränkl, Hochwart and others, but in some instances, the necropsy demonstration of a pineal tumor led to the crediting of all prior changes to pineal dysfunction.

The available histories frequently do not permit a restudying in the light of later developments in our knowledge of the interrelation of the several glands. When this is possible, many of the apparent discrepancies and conflicts are rendered more nearly harmonious through evidence of involvement of other glands,

especially the hypophysis, and secondary to it the sex organs. When, however, a delineation is made of the extent of these secondary influences and these are hypothetically set apart, there still remain alterations probably attributable only to primary pineal dysfunction. The complete syndrome is characterized by (1) overdevelopment of the sex organs, both anatomic and functional; (2) precocity of mental development; (3) general overgrowth of body with or without adiposity — the whole picture being one of early maturity. The syndrome is rarely complete. The most nearly complete cases have occurred in boys below or near 7 years of age. It is at this age rather than at puberty that the gland presents its greatest histologic evidence of a beginning involution.

A second pineal syndrome whose essential feature is cachexia has been described. This is much less definitely connected with pineal dysfunction, and has been more especially associated with the occurrence of tumors in adult life. It is described as representing apinealism.

The nature of the pineal syndrome, whether it be the outgrowth of hyperpinealism or hypopinealism, or whether a clinical condition corresponds to each of these deviations from normal, is not established. On the recognition of a specific pineal syndrome (or syndromes), efforts were made to establish its cause by reproducing the condition in animals through the experimental removal of the gland. The gland's extirpation is difficult, but has been successfully performed in both young and adult animals. The results are rendered less authoritative by the vitiating effects of the trauma necessary in the gland's removal. Pinealectomy determined no changes that might be associated with pineal functions as observed by the majority of investigators. Foa and Sarteschi, respectively, report that, of the animals which survived the operative procedures, some young males evinced certain features of the pineal syndromes. The similarity on comparison with clinical cases is remote.

The precocious macrogenitosomatic syndrome is usually ascribed to hypopinealism. The theory suggested above as current assumes that pineal lesions are destructive, and that concomitant metabolic disturbances arise from the lack of pineal secretion. To the contrary, running through the publication of a number of observers are to be noted suggestions that pineal neoplasms retain some of the functional characteristics of normal pineal cells, and that the pineal syndrome is due to increased rather than decreased function of the gland. The similarity of pineal tumor cells to normal pineal cells has been pointed out by Howell.[1] The retention of function in neoplasms in other glands is not infrequent; tumors in the hypophysis have in a number of cases occasioned acromegaly, a hyperpituitarism; tumors of the thyroid and metastases from thyroid tumors may secrete typical thyroid colloid; suprarenal gland neoplasms yield the active principle of the normal suprarenal; bile is secreted by certain liver tumors, whether they be located in the liver or metastasized to other portions of the body. The inference from such instances is that the cells of the neoplasm originating in an organ may, under certain conditions, retain some of the functional attributes of the normal cells of that organ. That pineal tumors may lead to an active constructive stimulating influence (hyperpinealism) is suggested in publications by Marburg,[2] Polavani,[3] Oestreich and Slawyk[4] and Askanazy.[5] However, the evidence used by Marburg may readily be turned to support the idea of hypophysial involvement in his case. Oestreich and Slawyk regard the early sexual maturity as hyperpinealism analogous to acromegaly from hyperpituitarism. Askanazy suggests that teratomas may be regarded as "false conceptions," in which one might expect, primarily at least, an increase in the pineal secreting functions (compare Bailey and Jelliffe). It is noteworthy that the best-defined cases of pineal syndromes regularly occur from pathologic conditions invading the actual tissue of the gland, rather than from simple cysts and from adjacent tumors involving the pineal only by compression.

In this rather uncertain situation, it is held that, in case uniform and consistent manifestations followed the experimental administration of pineal gland tissue, and these manifestations stood in some qualitative relation to evidence as to function derived from other sources, such experiments, rigidly controlled, would be acceptable as bearing on the functions of the gland. Accordingly, such experiments have been performed. The results have been indicated in part in a preliminary report.[6] A report of results from a continuation of this earlier work constitutes the remainder of this paper.

EXPERIMENTAL DATA

Feeding experiments with small animals, in which the results were measured in such terms as weight differences and body disproportions, are so vitiated by trivial differences in the living conditions of the experimental and control animals that any deductions should be made most guardedly. The findings from a single series of feeding experiments might easily be misinterpreted because of some deleterious influence of obscure origin. When, however, the investigation includes a number of series of animals, and the different series are maintained under varied experimental conditions, no accidental influence would constantly be exerted on a single phase of the experimentation. Any deviations from the normal, regularly appearing in the several experimental groups, may be attributed to the influence of the substances employed in feeding.

Because of this facility with which abstruse errors enter into feeding experiments, the preliminary work, which included results from feeding chicks, guinea-pigs and puppies, has been extended to include results from 393 animals. Variations have been introduced, in dosage, in method of administration, in source of material used (species and age of animals supplying glandular material) and in age of test animals. Except for one series of experiments on the influence of the pineal on embryonic development, guinea-pigs have been exclusively employed as test animals.

THE INFLUENCE OF PINEAL GLAND ADMINISTRATION AS SEEN IN WEIGHT DIFFERENCES

(a) Effect of feeding the pineal substance from old adult cattle to young animals.

Series A (forty-eight young pigs, aged 2 weeks, an equal number of males and females, sexes maintained apart) was equally divided into control and experimental lots. To the experimental lot, 10 mg. of pineal tissue from adult cattle

1. Howell, Hinds: Proc. Roy. Soc. Med. (Neurolog. Sec.), 1910, iii, 65.

2. Marburg: Wien. med. Wchnschr., 1908, lviii, 2617.
3. Polavani: Folia Neuro-Biologica, 1913, vii, 655.
4. Oestreich and Slawyk: Virchows Arch. f. path. Anat., 1899, clvii, 475.
5. Askanazy: Verhandl. d. deutsch. path. Gesellsch., 1906, p. 58.
6. McCord, C. P.: The Pineal Gland in Relation to Somatic, Sexual and Mental Development, THE JOURNAL A. M. A., July 18, 1914, p. 232.

was daily administered by mouth. The controls were similarly given a corresponding amount of inert material. This was continued ten weeks with weekly weighings. Since to the pineal are attributed functions confined to preadult life, it might be anticipated that feeding with mature glandular material would cause no change. On the other hand, the histologic picture of the adult pineal indicates the persistence of some glandular elements throughout life. The two lots of animals under observation as to this point ran essentially parallel weights. At the end of the ten weeks, the experimental animals had gained on an average of 130.5 per cent., while the controls gained 136.5 per cent.

As a check on Series A, Series G was similarly carried out with results as indicated in Table 1.

TABLE 1.—RESULTS OF FEEDING ADULT PINEAL GLAND TO YOUNG MALE GUINEA-PIGS (Series G)

Control, 12 Pigs Average Initial Weight, 197.6 gm. Age, 2 weeks			Pineal, 12 Pigs Average Initial Weight, 199.8 gm. Age, 2 weeks		
Weeks	Aver. Wt., Gm.	Gain, Gm.	Weeks	Aver. Wt., Gm.	Gain, Gm.
1	233.4	35.8	1	228.1	28.3
2	264.4	31.0	2	255.1	27.0
3	294.7	30.3	3	277.0	21.9
4	323.0	28.3	4	307.1	30.1
5*	349.1	26.1	5*	334.3	27.2
6	385.2	36.1	6	365.5	31.2
7	431.6	46.4	7	403.6	38.1
8	444.0	12.4	8	425.3	21.7
Average weight at end of eighth week..... 444.0 gm. Average initial weight.... 197.6 gm.			Average weight at end of eighth week..... 425.3 gm. Average initial weight.... 199.8 gm.		
Average gain..... 246.4 gm. Gain per cent. 124.7			Average gain..... 225.5 gm. Gain, per cent. 112.7		

* Feeding discontinued.

(*b*) *The effect of administering veal pineal glands to old experimental animals.*

The counterpart of the foregoing experiments was also undertaken. All earlier experiments in which the work was begun with young animals, but continued to the time of adult life, contribute data to this present phase of inquiry. Wherever it has been possible to induce a rapid body growth in immature animals, it has never been possible to continue this excessive growth above normal adult size. As the animals approach adult size, the pineal feeding is less effective, and after full maturity is reached, is without effect. There has, at no time, been a tendency toward gigantism.

Male guinea-pigs are sexually active before 4 months, and at 6 months are considered mature adults. However, these bucks subsequently slowly increase in size for several months before attaining their maximum weight. Series F (all males) was directed toward this period of growth. The animals were picked at 6 months of age, fed veal pineal tissue, and controlled as in other reported series. The feeding was maintained for four weeks, but weighings were continued for eight weeks. In this period the average experimental buck gained 167.6 gm., while the average control gained 121.4 gm.

(*c*) *The effect of administering pineal glands from young animals to young experimental animals.*

The greater portion of the data of the original paper is directed toward this phase. Of the more recent work, Series C, D, E and E_2 (hereinafter described, Table 3) contribute data.

Hypodermic Injections of Pineal Extracts: Several glandular principles are not sufficiently stable to survive the deleterious action of the digestive juices and the liver, and thus are not efficacious when administered orally. Whatever principles there may be in the pineal gland seem to pass through the digestive processes sufficiently intact to induce metabolic changes. To determine the comparative effects of pineal extracts administered orally and hypodermically, Series D (forty-eight young pigs, both sexes) was aseptically injected triweekly with 20 mg. of veal pineal tissue in 1 c.c. of water. The controls were injected with an equal quantity of brain tissue similarly prepared. A comparison of results from D with those obtained from the oral administration to animals of the same age is shown in Table 2.

TABLE 2.—COMPARISON OF RESULTS OBTAINED FROM ORAL ADMINISTRATION OF VEAL PINEAL GLAND WITH THOSE FROM HYPODERMIC ADMINISTRATION

Oral				Hypodermic			
Weeks	Gain Per Cent., Control	Gain Per Cent., Pineal	Per Cent. Difference	Weeks	Gain Per Cent., Control	Gain Per Cent., Pineal	Per Cent. Difference
2	9.3	10.9	1.6	2	17.2	56	18.8
4	24.7	32.5	7.8	4	30.4	45	14.6
6	22.	40.3	17.3	6	36.2	56	19.8

In Series E and E_2, another variation was introduced by the substitution of lamb pineal tissue for that of veal and cattle. The gland in lambs is of different shape from that found in cattle. The lamb gland is round instead of oval, the melano pigment is (when present) localized in the distal portion. The lamb glands weigh, on an average, 100 mg. The method of preparation of this tissue was the same as that earlier described. Such material was administered to the animals of Series E in 10 mg. amounts daily. The results are indicated in the general tabular summary. To E_2, 100 mg. of the same tissue was administered. This larger dose was evidently not well borne by the alimentary tract, for, during the eleven weeks of feeding, there were irregular periods of distinct loss of weight. Ultimately, however, an excess of 40.9 per cent. was determined as the gain of pineal fed over control animals.

(*d*) *Difference in effect of pineal administration on animals of different sex.*

The pineal clinical syndrome has been best established in males. In extirpation experiments, only in males have metabolic disturbances been described. Because of this apparent predilection for males, the results of feeding have been analyzed for data as to the relative responsiveness of the two sexes. Series E and a part of B have been analyzed. Early it was obvious that both males and females responded to pineal stimulation. It was anticipated that the males would make greater gains than females in both the control and experimental lots. Computations have been based on gains of experimental males over control males in comparison with gains of experimental females over control females. On such a basis, two thirds of the excess gains are made by male animals. This was observed in Series E, in which the total period determined a general excess of 19.3 per cent. in favor of experimental animals. Analysis of this gain by sex indicates a 25.8 per cent. gain for the males, and for the females, 12.7 per cent. Details of the analysis of Series B are given in Table 4.

TABLE 3.—PERCENTAL GAINS OF VARIOUS SERIES DURING SIX WEEKS' GROWTH

Series	Second Week		Fourth Week		Sixth Week	
	Control	Pineal	Control	Pineal	Control	Pineal
B	9.3	10.9	24.7	32.5	32.0	40.3
C	26.3	26.6	45.3	47.6	71.5	80.1
D	17.2	36.0	30.4	45.0	36.2	56.0
E	21.2	24.6	45.5	50.6	59.3	78.4
E_2	27.7	22.6	47.0	53.3	68.7	82.4

(*e*) *Summary and comment on weight differences.*

The data accruing from two years of feeding experiments with pineal substance are sufficiently extensive to free the results of accidental vitiating factors. Averages of a number of experimental series aggregating nearly 400 animals would indicate that young animals to which had been administered pineal tissue developed at a rate in excess of normal controls.

The most pronounced results arose from the feeding of young animals with material derived from young animals.

Although some histologic evidence exists indicating the glandular nature of the pineal in mature adult life, such material, when fed to young animals, did not bring about the changes observed in feeding with younger pineal material.

At no time has gigantism been produced. As adult life is approached, pineal feeding is less effective.

The excess growth of young animals under pineal feeding is grossly symmetrical. No disproportion has been observed except a possible hypertrophy of the testes noted in some animals. In microscopic sections, such testes are seen to be made up of larger and more mature tubules than in controls of the same age, but with no increase in the interstitial tissue.

TABLE 4.—ANALYSIS OF GAINS BY SEX (Series B)

Weeks	Control, 2 Weeks Old				Pineal, 2 Weeks Old			
	Males		Females		Males		Females	
	Aver., Gm.	Gain, Gm.	Aver., Gm.	Gain, Gm.	Aver., Gm.	Gain, Gm.	Aver., Gm.	Gain, Gm.
	200.9	....	205.9	....	204.5	....	208.4	....
1	200.0	—0.9	192.0	—13.9	203.2	—1.3	211.9	3.5
2	219.9	19.9	219.8	27.8	249.0	45.8	224.9	13.0
3	251.5	31.6	224.4	4.6	284.1	35.1	242.3	17.4
4	277.7	26.2	250.1	25.7	309.9	25.8	259.1	16.8
5	295.5	17.8	266.2	16.1	331.8	21.9	277.4	18.3
6	296.7	1.2	262.7	—3.5	342.1	10.3	282.8	5.4
7	326.2	29.5	286.6	23.9	372.3	31.2	305.2	22.4
8	345.3	19.1	305.5	18.9	401.5	29.2	325.2	20.0
9	360.9	15.6	314.0	8.5	409.8	8.3	326.1	0.9
10	402.2	41.3	349.4	35.4	452.2	42.4	371.4	45.3
11	417.5	15.3	367.8	18.4	479.0	26.8	387.4	16.0
12	427.4	9.9	379.7	11.9	487.8	8.8	402.5	15.1
13	433.3	5.9	383.4	3.7	488.5	5.7	421.6	19.1
14	458.1	24.8	413.9	30.5	522.4	33.9	444.3	22.7
	Males		Females		Males		Females	
Last weight....	458.1 gm.		417.9 gm.		522.4 gm.		444.3 gm.	
Initial weight..	200.9 gm.		205.9 gm.		204.5 gm.		208.4 gm.	
Average gain...	257.2 gm.		212.0 gm.		317.9 gm.		235.9 gm.	
Gain per cent...	128.0		103.0		155.4		113.2	
Excess pineal males over control males.....								27.4 per cent.
Excess pineal females over control females.....								10.2 per cent.

Both males and females are affected by pineal administration, but the gains (in relation to respective controls) have been greater for the males than for females.

THE INFLUENCE OF PINEAL FEEDING ON SEXUAL MATURITY

Of any several groups of premature guinea-pigs maintained under normal conditions, it is assumed that individuals will attain to sexual maturity near the same time and will give birth to young at about the same subsequent time. In case of a regularly recurring marked difference in time of birth of first young in one phase of an experimental lot of animals, it is rational to associate this phenomenon with different times of attaining to maturity. On such a basis it has been noted in all groups of animals which were allowed to breed that the pineal-fed mothers gave birth to young earlier than the controls. One series including forty-five animals was carefully conducted with a view to any data bearing on the matter in question. The two sexes were kept together from birth. The feeding with veal pineal tissue was continued for fourteen weeks. During this time the pineal-fed attained to a size 32 per cent. larger than their controls of the same ages. The female farthest advanced in pregnancy among the pineal-fed animals aborted, so that the date of birth of first young was not determined. The first normal birth occurred July 3 in the experimental group. Others of the same group followed until over half the females had given birth to young. Then three weeks and two days later, July 26, the first control pig was born. The progeny in all instances were like any other pigs. After all pigs were born in both groups and after an interval of several weeks, the same females were placed with normal bucks to detect a possible difference in the second pregnancy. No such difference was detectable.

GENERAL SUMMARY

From the foregoing experiments, evidence of the precocity of development usually attributed to pineal deficiency (hypopinealism) has been obtained in animals by supplying an increased amount of pineal substance by feeding or injecting pineal preparations. Such administration of pineal substances led to a more rapid growth of body than normal, and determined an early sexual maturity. The excess in rate of growth was most pronounced (40.9 per cent. excess in eleven weeks) in *young* animals fed with pineal tissue obtained from *young* animals. No tendency to gigantism has followed pineal administration. After maximum size was attained, pineal administration appeared to be ineffective. Both males and females respond to the influence of pineal substances in rate of growth, but the response has been more definitely manifested in males.

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DUODENAL ALIMENTATION

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The internal treatment of gastric and duodenal ulcer is rightly receiving widespread attention.

Most modifications of the old established methods are founded on the same principle, namely, to rest the stomach as much as possible until the acute symptoms disappear, to reduce secretions, and to bind the existing secretions. Such procedure, if effectively carried out, is favorable to the healing of the ulcer. It is essential, of course, to observe the treatment most minutely and persistently. Boas and others are right when they state that the reason so many uncomplicated ulcers are receiving surgical treatment is that general practitioners, and to some extent even specialists, do not sufficiently await results from the internal treatment. One often hears that a decision as to whether a gastric or duodenal ulcer should receive medical or surgical treatment depends on the circumstances of the patient. It is sometimes asserted that in the case of persons who must earn their daily bread and have not the time to undergo a regular ulcus treatment, it is best to operate.

That this argument is not logical is self evident. First, surgical treatment involves a longer time than the medical for a complete cure. Secondly, the final results of surgical treatment of uncomplicated ulcer are no more favorable than those of medical treatment. Finally, the direct mortality danger involved in operative procedure, even if only a gastroenterostomy is done, is still from 2 to 4 per cent. It is a great advantage, therefore, to find a therapeutic agent which promises to be an additional aid in the internal treatment of gastric and duodenal ulcer. Duodenal alimentation may prove to have the desired effect.

DUODENAL FEEDING

Max Einhorn[1] advised feeding by means of the duodenal tube, and indicated such feeding in all cases in which it is desired to rest the stomach and in which, for some reason, the food is not retained or well

1. Einhorn, Max: Med. Rec., New York, July 16, 1910.

borne by the stomach. Indications include ulcus ventriculi or duodeni, marked cases of ptosis and atony, cirrhosis of the liver, nervous vomiting and persistent vomiting of pregnancy, and inoperable cancer of the stomach. Lately Einhorn observed that the duodenal tube has no injurious effect even in acute bleeding of the stomach or duodenum.

Einhorn and Rosenbloom[2] found that duodenal feeding maintains the nitrogenous equilibrium.

The length of time during which such feeding was carried on was from eight to fifteen days. The food used consists of from 240 to 300 c.c. of milk at body temperature, one raw egg, and 15 grains of lactose. This quantity is introduced every two hours. In order to increase the quantity of fluid Einhorn administers a saline solution by rectum, by means of the Murphy drop method, or water is given by the duodenal tube drop by drop. If the lactose causes diarrhea, it is discontinued. If the milk is not borne well, strained barley, or strained pea soup is sometimes given. Feeding should be administered very slowly, each feeding lasting for twenty minutes.

The first two or three days there is apt to be some nausea or retching, a sensation of distention, and even the vomiting up of the tube. Einhorn prefers the use of a thin tube because it is tolerated better by the patient. He states, however, that the food is not so easily introduced through a narrow as through a wide tube.

This method of feeding seems to be a happy idea, as it gives us a chance, if possible, to replace rectal feeding in the great majority of cases in which the stomach is to be put to rest, and at the same time to introduce sufficient food directly into the small intestine, where it can well be digested and absorbed. It is essential, however, to have an exact understanding of the physiology of digestion and absorption in that part of the small intestine with which the food is brought into contact. With this in mind we are enabled to judge the kind of food, the quantity, and how it should be given.

THE INTESTINAL SECRETIONS

It will be remembered that the intestinal juices contain a number of ferments; erepsin breaks up the products of protein digestion by pepsin and trypsin, into the end-products of amino-acids, and acts directly on the casein. Lipase, the fat-splitting ferment, exercises its action on the finely emulsified fats. Of the carbohydrate ferments, the intestinal juices contain lactase, maltase and invertin. There is also present a nuclease. We therefore see that ferments do exist in the small intestine, to act on a number of important foodstuffs essential to life.

It is likewise known through the studies of Pawlow and his pupils, as well as those of Cohnheim and his co-workers, that the intestinal juices are stimulated by local irritation, but that the ferments are not increased with the quantity of secretions.[3] If, however, food is directly introduced into the intestine, secretions with corresponding ferments are stimulated. This in itself would justify duodenal feeding. But the ferments in the intestine are primarily not so extensive in their action as those of the pancreatic juice, and for predigestion the ferments of the pancreatic juice are undoubtedly essential, even if the food is directly introduced into the small intestine. Drawing our conclusions from the experimental evidence furnished by the studies of Hamburger, Heckman, Babkin and others (who found that absorption of intestinal juices in one part of the small intestine stimulates secretion of active intestinal juices in another part reflexly by way of the nervous system, or by way of the blood), it is reasonable to assume that when food is directly introduced to the small intestine, pancreatic secretion is stimulated and aids in digestion.

That stimulation—even of the rectum—by food causes secretion in the stomach is an established fact, and would tend to substantiate our assertion. If gastric secretions are likewise stimulated by duodenal feeding, the rest intended for the stomach is not a complete one. But the disturbing element of these secretions is to a great extent removed, first, because the local irritant, the tube in the stomach, causes an abundant mucus secretion which neutralizes the acid; this is proved by the fact that after the tube is removed, thick layers of mucus surround the tube; secondly, the secretions in the stomach in the absence of any food gradually diminish in acidity, and lastly, through the open pylorus, bile and pancreatic juice regurgitate and so lower the acidity. Such factors in the stomach tend to diminish peristalsis or completely do away with it, thereby establishing complete rest.

The rhythmic contractions in the small intestine have, according to Cannon, the object of making the digestive juices more accessible to the food. Experiments demonstrate that if food reaches the intestine not predigested by stomach and pancreatic juices, these rhythmic contractions are slower, thereby allowing the intestinal juice to adapt itself to its unaccustomed task.

Considering the foregoing facts — the existence of the ferments in the small intestine, their increase as a response to the local introduction of food, and the accommodation of the rhythmic contractibility of the small intestine to the contents — it is easily conceived that direct feeding by means of the duodenal tube is a very plausible means of supplying enough calories to maintain body weight. However, as the food introduced directly into the small intestine is primarily foreign to that part of the viscus, our aim must be to give the viscus the opportunity to adapt itself. This is accomplished by administering such food at the beginning of the feeding as is most easily digested and most completely absorbed. It may consist of the following:

Of the proteins, it is the casein of the milk that is completely digested by the erepsin; the lactose is acted on by the lactase; the finely emulsified fat of the milk is acted on by the lipase of the small intestine. The water and the salts of the milk are also readily absorbed there. Of the carbohydrates, the monosaccharids are absorbed in solution of from 6 to 8 per cent. A difference exists in the absorbability of the various kinds of monosaccharids. Glucose and galactose are more quickly absorbed than levulose and mannose. Maltose and glucose completely disappear within an hour, while of the lactose in equal quantity, only 26 per cent. is absorbed.

During the first period of feeding, milk as well as from 6 to 8 per cent. of glucose solution is the most rational form of feeding. After three days we increase the caloric value by increasing the fat, in the form of yolks of egg, which at the same time carries to the

2. Einhorn and Rosenbloom: Am. Jour. Med. Sc., 1913, cxlii, 7.
3. Savage: Dissert., St. Petersburg, 1904, p. 6.

system lecithin and phosphorus. Pure cream is best given in small quantities, and even then if not borne well (as manifested by diarrhea) it is best to add pankreon to the cream in a formula given below. After the sixth day the whole egg is usually borne well. The feeding is administered by means of the Einhorn or Gross duodenal tube.

THE APPARATUS

As the use of the duodenal tube is not occupying the position it deserves, it will not be out of place here to mention briefly the difference which exists between the Einhorn and the Gross tube and the mode of introduction of the Gross tube, which we use exclusively.

The Einhorn tube is narrower and the ball is much lighter in weight, 2.5 gm., while the Gross tube has a diameter of 7 mm. and the ball is much heavier, from 10 to 11 gm. in weight. The Einhorn tube is introduced with the patient sitting, and the propulsion of the little ball into the duodenum is dependent on the propulsive action of the stomach.

The Gross weighted tube works its entire way by gravity; hence the position of the patient is varied, while the tube is being introduced, in order to favor gravitation of the ball. Originally Gross advised the following mode of introduction:

The patient assumes a comfortable position in an armchair, with the head slightly inclined backward, so as to let the ball fall back toward the posterior pharyngeal wall.

The patient, having well moistened the ball with his saliva, is told to swallow it as he would a pill. As soon as the ball has arrived at the posterior faucial wall, the patient is requested to swallow energetically a few times. At the same time we rapidly push the tube in, in order to facilitate the ball gliding down. It is important that the patient's act of swallowing and the act of pushing in the tube be executed simultaneously, as otherwise the ball will be returned again and again by retching.

With this manipulation there is no need for the patient to wash the ball down with a drink of water. We have always been able to dispense with water. Slight cyanosis, due to spasm at the entrance to the larynx, is quickly overcome. Once the narrow place is passed, there is no further obstacle to the advance of the tube. When the tube has been swallowed down to mark 45 cm., we convince ourselves of the unimpeded passage by lightly blowing into the tube. Should there be an obstruction, caused by kinking, it is rapidly overcome by slightly withdrawing the tube.

As soon as the patient has assumed the right decubitus, the tube is gently pushed forward, rather following the traction of the ball. The tube is allowed to glide in to mark 70 cm. (about 10 cm. beyond the pyloric ring), in order to have a sufficient length of tube hang in the gastric cavity, enabling the ball to work its way onward.

At this juncture the patient is instructed to hold the tube in position by slightly biting on it for from one half to three quarters of an hour, in fact, long enough to allow the ball to enter the duodenum. Pushing the tube still farther in before this time has elapsed would simply cause it to roll up in the stomach, frustrating the entire procedure.

During this time the patient usually falls asleep, while the physician may attend to other duties. When the one half or three quarters of an hour has expired, the contents are aspirated from time to time until characteristic duodenal juice appears in the receptacle, which is usually the case after from half an hour to an hour.

This, our method of introducing the apparatus, entirely circumvents the fundus action of the stomach, as it brings the little ball at once to that part of the stomach — the pars pylorica — which alone is concerned in the propulsion of its contents.

Holzknecht of Vienna[4] and Lippman of San Francisco[5] modified the mode of introducing the Gross duodenal tube as follows: The tube is swallowed up to 45 cm. with the patient in a sitting position; the patient then climbs on the table on all fours and turns immediately on his right side with head and chest elevated. In this position the tube is introduced to 70 cm. After five minutes he is placed on his back with elevated pelvis. After another five minutes the tube is pushed down further to 80 cm. In five minutes more, the duodenal contents can as a rule be obtained. According to the authors mentioned, it takes from fifteen to twenty minutes for the tube to reach the duodenum.

For the Einhorn tube to reach the duodenum, the minimum time is from three to four hours; the maximum from ten to twelve hours, because the tube relies entirely on the propulsive action of the stomach. The narrower tube is considered an advantage by Einhorn because it causes less irritation; on this theory Palewski devised a duodenal tube which Holzknecht and Lippman rightfully term a combination of the Einhorn tube and the Gross ball. We have never observed any irritation caused by the larger tube, and, for convenience in feeding, Einhorn himself states that a larger sized tube facilitates the introduction of food. In spite of the best method, it sometimes happens that the ball halts before a closed spastic pylorus. In such cases it is found practical to introduce through the tube a few tablespoonfuls of olive oil, which neutralizes the hydrochloric acid and facilitates the opening of the pylorus. It is essential to introduce the tube as far as from 120 to 125 cm. in order that it may not slip back during the entire time the tube is in the small intestine.

MODE OF FEEDING

Before food is introduced, we ascertain by blowing that the lumen is patent, and that the tube is in the intestine, by aspirating the intestinal contents. The food is introduced through a glass funnel attached to the outer end of the tube. It is essential, as already stated by Einhorn, that the food be given very slowly. With the Gross tube, each feeding can be accomplished in about ten minutes or less.

The quantity of food from day to day is given as follows: the first three days, 250 c.c. of warm milk, to which 15 gm. (one tablespoonful) of glucose is added, every two hours. This yields in feedings 1,528 calories.

On the fourth day, yolk of egg is added to the milk three times a day, an additional 174 calories — total in twenty-four hours, 1,702 calories.

If this is tolerated well, we can on the fifth and sixth days add one yolk of egg to each feeding, which supplies another 232 calories and makes a total of 1,934 calories.

4. Holzknecht: München med. Wchnschr., Sept. 29, 1914.
5. Lippman, C. W.: Simplification of the Duodenal Tube Examination, The Journal A. M. A., March 24, 1914, p. 911.

On the seventh day we add to three feedings the entire egg, the other feedings remaining the same — a total in twenty-four hours of 1,955 calories. If this is borne well, we give the patient an egg to each feeding on the eighth day — a total of 2,053 calories.

On the ninth day one tablespoonful of sweet cream is added to each feeding — a total of 2,350 calories in twenty-four hours. This quantity is kept up until duodenal alimentation is completed — until the end of the fourteenth day.

In some patients Einhorn encountered nausea, retching, even vomiting and diarrhea if cream or lactose was given in the beginning of the feeding. The reason for this is obvious. As the intestine is not accustomed to this kind of feeding, the cream necessarily causes irritation; lactose, besides being a mild laxative, is but slowly and not completely absorbed, and also causes irritation. It is best, therefore, to give the cream in the last days of feeding, and substitute glucose for the lactose. Should the cream even then cause diarrhea, it can be overcome by adding 0.5 gm. pankreon to each tablespoonful of cream. The deeper the tube is inserted, at least to 125 cm., the fewer chances are there for any of the unpleasant effects mentioned by Einhorn. This is achieved with the heavier weighted tube. Walking facilitates and hastens the desired progress of the tube.

Einhorn mentions that if the patient complains of excessive thirst, water can be introduced by the drop method through the duodenal tube, or normal saline by rectum. We find as a rule that the patient does not complain of any thirst, because he gets sufficient fluids with his milk. Besides this, 50 c.c. of water is used by us before each feeding to clean the tube, which gives the patient additional fluid of 350 c.c. in twenty-four hours. The sensation of thirst is due to the dryness of the mouth, which is easily overcome by having the patient rinse his mouth several times a day. The frequent cleansing of teeth and mouth is essential in order to prevent parotitis and its consequences. Other unpleasant sensations of the patient during feeding, like distention, peristaltic unrest, and even light cramps, have not been observed by us, owing to the fact that the feeding is not forced down by a syringe, which is absolutely necessary in a narrow tube, but is allowed to flow down through a glass funnel through the wider tube.

INDICATIONS FOR DUODENAL FEEDING

The indications made by Einhorn are mentioned above. We have thus far confined ourselves exclusively to the duodenal feeding of absolutely diagnosed cases of gastric or duodenal ulcer which have not yielded to the older methods of treatment. Let it be distinctly understood that the duodenal feeding has, in our opinion, by no means replaced the old reliable and well-established methods of internal treatment of gastric and duodenal ulcer. All methods—from the most conservative method of von Leube, through the manifold intermediary modifications to the most radical Lenharz method — have their special value and indications in individual cases. If, however, an ulcus treatment conscientiously carried out for one week does not relieve the symptoms at all, be it on account of atony, persistent acidity and secretions, or even because of the existence of adhesions, we institute the duodenal feeding.

After the tube is removed, the patient must not at once be allowed a liberal diet, even though he has no symptoms. We must bear in mind that the stomach, having received no food for such a length of time, must be educated gradually to nourishment. Again, while the secretions are at low ebb when the patient begins to eat, the tendency to hypersecretion and hyperacidity may still exist. Furthermore, one cannot absolutely foretell to what extent a florid ulcer has healed in the course of that time.

The first two days after the tube is removed, the patient receives milk with sweet cream and six eggs daily. On the third day, toast and butter and fine cereals are allowed. On the sixth day, the diet corresponding to the third week of the von Leube ulcer treatment is begun, and continued with the von Leube treatment until the end of the sixth week. Five days after removal of the tube, the patient is allowed to attend to his business. Should it happen that the symptoms recur when the patient goes on a more liberal diet, we go back to the fluid diet for a few days, and if that is ineffective another course of duodenal feeding can be tried for one week.

SUMMARY

We have in duodenal alimentation a very substantial addition to the old established methods of internal treatment of gastric and duodenal ulcer. The method is simple, and with the wider tube and the heavier weighted ball (Gross duodenal tube), introduction is hastened. Furthermore, the tube remains low down in the desired position, and feeding is readily accomplished. This mode of treatment is easily learned, and it can even be carried out in the house of the patient.

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QUININ AFTER OPERATION

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Since the preliminary report on "Quinin Salts in Postoperative Cases,"[1] we have used this method exclusively at St. Anthony's Hospital in 600 cases, comprising all operations requiring an ether anesthesia.

The technic has been slightly modified: Quinin muriate, 10 grains, dissolved in 2 ounces of water at 100 F., is given by rectum immediately after operation, followed by saline proctoclysis or (in septic cases) by 6 ounces of olive oil. The quinin is repeated every six hours for from four to six doses. In large or stout individuals, the first two doses are given four hours apart. In case saline proctoclysis is used, it should follow the quinin in about thirty minutes for best results.

The sulphate of quinin, by many repeated trials, has not proved so efficient as the muriate. The difference is probable due to solubility.

The postoperative backache is practically eliminated, and only about 2 per cent. suffer any gas pain to speak of. If such is present, one enema produces an efficient result when it is desired to move the bowels freely or to favor the passage of flatus. Gas is expelled spon-

1. Bonnot, Edmond: Quinin Salts in Postoperative Cases, THE JOURNAL A. M. A., Jan. 9, 1915, p. 146.

taneously by rectum in 75 per cent. of the cases within from eighteen to twenty-four hours after operation.

The frequency and duration of the period of postoperative nausea and vomiting are very much lessened. Vomiting is present, however. Frequently a single stomach wash ends all nausea and vomiting permanently.

After gastro-enterostomies, patients have been made comfortable with only two stomach washings, as compared with a washing from every four to six hours formerly.

The postoperative thirst is much retarded, and in over 60 per cent. absent.

The treatment is particularly efficient in children, the quinin being given in proportionate dose.

The patient usually has a free bowel action within twenty-four hours when morphin has not been given.

This treatment is of special advantage in operations in which there is much trauma. For instance, two stout women were operated on for umbilical hernia (Mayo's method), and another weighing 235 pounds was operated on for a 40-pound pelvic tumor associated with many adhesions to the parietal wall and abdominal viscera. These patients had absolutely no pain or discomfort after the operation—not even pain in the wound.

A pregnant woman (before two months) was operated on for appendicitis, and the quinin was administered in the usual way. She was troubled with nausea and vomiting, but suffered none of the other postoperative discomforts. The quinin did not interfere with the pregnancy.

A doctor had a hysterectomy performed. She did not complain of any pain or discomfort; neither did she require or ask for morphin, notwithstanding the fact that doctors are more apt to complain of pain than any other class of people.

We have used the quinin in only two instances following chloroform. One did nicely, but the other patient became very cyanotic immediately following the quinin administration, which had to be discontinued, and the patient recovered. It would be advisable, therefore, if given following chloroform, to wait until the patient has regained consciousness.

The only complications following the treatment were three of cinchonism, deafness particularly, and one of drug eruption which lasted three days; but the patient did not suffer at all.

Patients feel comfortable after operation, and on this account sleep without morphin. Ninety per cent. of the patients recover comfortably and without any complications on this after-treatment. Morphin is seldom, if ever, required.

Sodium bromid, 20 grains, was associated with each dose of quinin in fifteen laparotomies, with the result that the patients slept well the first night and following day. They were not in the least nervous. The nausea and vomiting seem still less than when the quinin is given alone. The number of patients observed is too small, however, to justify any definite deduction.

The beneficial action of bromid so administered was especially marked in eight goiter cases. The nervousness that usually follows operation in this class of patients was entirely absent, and the patient rested comfortably the first night and following day. This is due evidently to the sedative action of quinin bromid on exophthalmic goiter patients.

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PROTEOLYTIC FERMENTS IN PORTAL BLOOD *

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Since the publication by Emil Abderhalden of his results with the serodiagnosis of pregnancy and of various pathologic conditions, some doubt has been cast on certain of the fundamental principles of the test as described by him.

In his description of the technic, he[1] stipulates that the blood must not be taken at the height of digestion. He attempts to explain the positive reactions that occur when the blood is obtained at this time on the supposition that the amino-acid content of the blood is raised to such an extent that they dialyze out and cause a positive reaction without ferment activity occurring in the experiment.

The more I worked with the test, the more skeptical I became regarding the validity of this explanation. To settle this point, blood was obtained from men and dogs at the height of digestion. One c.c. of the clear serum was placed with 1 gm. of placental protein; an equal amount of the same serum was inactivated at 60 C. (140 F.) for one hour, with an equal amount of placental protein. They were then allowed to dialyze twenty-one hours at 37 C. (98.6 F.). The dialysate from the active serum gave uniformly positive reactions, while those from the inactivated serum were uniformly negative. Had the reaction been due to the amino-acid content of the blood, then an equal amount of amino-acid would have dialyzed out of the inactivated serum and out of the active serum. Therefore, it would seem that at the height of digestion, the proteolytic ferment of the blood is increased to an appreciable extent, and that this is the reason the Abderhalden test cannot be relied on when the blood is taken at this time.

In seeking a possible source of this ferment increase, let us consider some fundamental facts of digestion and absorption. After the ingestion of a meal, there is poured out along the alimentary tract from the stomach to the cecum a mass of digestive fluid, rich in active proteolytic ferments. These mingle with the food, and rapidly split it into proteoses and peptones, and the end-products of tryptic digestion. During the process, this fluid, rich in active ferments, is bathing the surface of a rapidly absorbing mucous membrane. It seems highly probable that the ferments themselves are absorbed into the blood together with the products of tryptic digestion.

Regarding our knowledge of the absorption of digestive ferments Hammersten[2] says:

> The soluble constituents of the digestive secretions may, like other dissolved bodies, be absorbed, as is demonstrated by the passage of pepsin into the urine. The enzymes also may be absorbed.

Von Leyden and Bergell,[3] in their work on the trypsin treatment of carcinoma, came to the conclusion that large doses of trypsin by mouth cause an increase in the tryptic content of the urine, and so must have been absorbed from the alimentary tract.

* From the Departments of Experimental Medicine and of Obstetrics, University of Illinois, College of Medicine.
* Read before the Chicago Pathological Society, April, 1915.

1. Abderhalden, Emil: Beitr. z. Klin. d. Infectionskr. u. Immunitatsforsch., 1913, i, 243.
2. Hammersten: Physiologic Chemistry, New York, John Wiley and Sons, 1904, p. 356.
3. Von Leyden and Bergell: Ztschr. f. klin. Med., 1907, lxi, 361.

Glaessner[4] has shown that the blood serum is richest in antitrypsin during the height of digestion. This supports my results, for in many conditions in which I have demonstrated an increase in the tryptic power of the serum, Jobling, Eggstein and Petersen[5] and others have demonstrated a corresponding increase in the antitryptic power of the blood. This also is exactly what we should expect to find when we remember how quickly the body responds to the injection of any ferment by the prompt production of an antiferment.

Julius Pohl[6] has pointed out that the portal blood contains more leukocytes than the peripheral blood during the height of protein digestion. It may be that this is associated in an etiologic respect with the increase in the ferment content, or it may be merely a concomitant phenomenon. Some work which I[7] have recently done in the infectious diseases tends to show that the leukocytes may be reduced in cases that give very strong reactions, while cases that have a high leukocytosis often give a weak reaction.

It was thought advisable, therefore, to undertake to demonstrate whether or not these ferments were present in appreciable amounts in the portal blood.

A dog was anesthetized with ether, and the femoral vein was dissected out. Ten c.c. of blood were withdrawn, and allowed to clot in a sterile centrifuge tube. Laparotomy was next performed. After a loop of jejunum had been brought outside the abdomen, a large mesenteric vein was selected, and 10 c.c. of blood were withdrawn with a sterile Luer syringe and allowed to clot in a centrifuge tube. The clear serum from these samples was submitted to typical Abderhalden tests. Human placenta was used as a substrate. The technic followed was that of Abderhalden, the details of which I have described in a previous paper.[8]

The results are given in the accompanying table. They show that the portal blood and the peripheral blood both contain ferments in demonstrable quantities at the height of digestion. Also the portal blood is much richer in such ferment than the femoral blood. This is true not only of the blood at the height of digestion, but also in the fasting state. However, the degree of difference between the portal blood and the femoral blood ferment content is much less, as a rule, in the fasting state than in the state of active digestion.

It is interesting to note that the controls in these cases were uniformly negative, except for faint traces in the portal blood controls. This speaks against the view that the proteins are absorbed into the blood as amino-acids. However, the amount present in 1 c.c. of blood serum might be too small to give a positive reaction with ninhydrin, under the condition of the test.

COMMENT AND THEORETICAL CONSIDERATIONS

The presence of a positive reaction, though less intense in the fasting dogs, was somewhat of a surprise to me, and essentially altered my preconceived ideas of what might be expected from the test under these conditions. However, a very plausible explanation is adduced by the work of Boldireff,[9] who showed that in the fasting dog there was an intermittent pouring out of ferments into the gastro-intestinal tract, at intervals of about every two hours. The absorption of this fluid into the blood could account for the positive reaction obtained in the fasting condition.

A possible explanation of the stronger positive reaction in the portal blood may be found in the experimental work of Jobling and Petersen,[10] who showed that soaps, fatty acids and lipoidal substances inhibited the action of trypsin and leukoprotease. It is a well-known fact that the greater portion of the fat is absorbed from the intestine into the lacteals and is poured into the peripheral blood by way of the thoracic duct. Hence the peripheral blood ought to be richer in antiferment than the portal blood, which receives practically none of this antiferment.

To my mind, the problems suggested by this work centers round the idea of the conservation of ferment. It would appear that the ferments that are poured out at each digestion period are not used up completely, and thus lost to the body economy, but are absorbed into the blood, where they in all probability continue their activity until destroyed. Possibly they are also taken up by the various cells of the body to aid in the intracellular metabolic activity. Indeed, it might be assumed that the pancreas and intestines produce the greater part of the ferments that are found in the body, and that this is the source of the so-called diffusible proteolytic ferments.

RESULTS OF EXPERIMENTS*

Dog	Digestion Period	Portal Blood	Femoral Blood	Portal Control	Femoral Control	Remarks
1	Active	+ + + + +	+ +	±	—	
2	Active	+ + + +	+ + +	±	—	
3	Fasting	+ +	±	—	—	
4	Fasting	+	—	—	—	
5	Active	+ + +	+	—	—	
6	Active	+ +	+ + +	±	—	Slight excess of ninhydrin used in femoral dialysate
7	Active	+ + + +	+ +	—	—	

* Human placenta was used as substrate. Dialyzation period was twenty-one hours at 37 C. Inactivated serum (60 C. for one hour) plus placenta were used as controls. Positive is indicated by the sign +, negative by —, and faint by ±.

4. Glaessner: Beitr. z. chem. Physiol. u. Path. (Hofmeister's), 1903, iv, 79.
5. Jobling, Eggstein and Petersen: Jour. Exper. Med., xxi, 239.
6. Pohl, Julius: Arch. f. exper. Path. u. Pharmakol., 1888, xxv, 31.
7. Falls, F. H.: Jour. Infect. Dis., 1915, xvi, No. 3, 466.
8. Falls, F. H.: A Study of the Ferment Activity of the Blood Serum, THE JOURNAL A. M. A., Oct. 3, 1914, p. 1172.
9. Boldireff: Arch. d. sc. biol., 1905, xi, No. 1.
10. Jobling, J. W., and Petersen, W.: Jour. Exper. Med., March 1, 1914, p. 239.

Further, it is possible that the great mass of the ferment absorbed from the intestine is taken out by, or rendered inert in, the liver. It has long been known that the liver cells are particularly rich in proteolytic ferments, and this work may serve in part, at least, as an explanation of this fact. It would seem possible or even probable that the protein molecule is broken down to the higher split products in the intestine, and absorbed as such, together with the major portion of the ferments in the intestinal tract. These are then carried to the liver, where the proteases and the peptones are still further disintegrated by the combined action of the ferment absorbed, and that present in the liver cells. The lower split products, the amino-acids, are then thrown into the peripheral blood, together with a certain amount of ferment, both of which are absorbed into the cells of the body and used in their intracellular economy. Most of the ferment may be used up in the liver, or absorbed into its constituent cells to replace the loss occasioned by their digestive activity.

The foregoing discussion, of course, is purely theoretical, and is merely suggested by the results of these experiments. Further work is in progress which may shed more light on these points.

CONCLUSIONS

1. The portal and peripheral blood of the dog contain a demonstrable increased amount of proteolytic ferment at the height of digestion.
2. This is also true of the portal blood in the dog in the fasting state.
3. Under both the foregoing conditions, the portal blood is relatively richer in ferment than the peripheral blood.
4. The probable source of this ferment is the ferment-rich intestinal contents at the height of digestion.

RECENT EXPERIENCES IN THE ORIENT WITH CHENOPODIUM AS A REMEDY AGAINST HOOKWORM AND OTHER INTESTINAL PARASITES

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Owing to the disturbances caused by the war, thymol, which was the most generally used remedy against hookworm, became scarce, expensive and difficult to obtain. Many physicians began to use oil of chenopodium, against which there had been much objection heretofore, owing to its alleged frequent tendency to produce untoward effects and even death. Severe nephritis was reported by some observers and paralysis of the central nervous system by others. Soon after the use of the oil was begun during the autumn of 1914, cases of death ascribed to chenopodium were again reported. Whether these deaths were rightly or wrongly due to chenopodium has probably not been definitely settled. In the Orient the oil of chenopodium has been very extensively employed against hookworm and other intestinal parasites, and it may therefore be of interest to make a brief report of the experience in that part of the world.

Dr. R. D. Keith, dean of the Singapore Medical School and visiting physician to the General and Tan Tock Seng hospitals of Singapore, states that he has treated over 1,000 cases of hookworm with oil of chenopodium without a single bad result. He considers the drug far superior to thymol, eucalyptus or beta-naphthol, and states that the hookworms are more completely eliminated; it is only rarely that any ova can be found in three microscopic slides, taken three days after the treatment is completed, and most carefully examined. He allows the patient only a very light supper, no breakfast and then 10 minims of oleum chenopodii, preferably in a capsule. This treatment is given each morning for three days. The last dose is followed two hours later with a tablespoonful of castor oil.

A number of other physicians in Singapore have had a similar experience with a smaller number of cases.

At the General Hospital, Kuala Lumpur, the oil of chenopodium has been administered under the general direction of Dr. Sansom, principal medical officer, in more than 500 cases of hookworm disease, without any untoward effects and with the same efficiency as at Singapore.

Dr. W. Schüffner states that in the hospitals of Sumatra Dr. Baermann and himself have treated over 40,000 cases of hookworm with oil of chenopodium without after-effects and with results superior to those obtained with thymol. On a method based on the number of worms expelled the chenopodium showed an efficiency of 91 as against 83 for thymol. Schüffner recommends that the patient be given liquid diet for the evening meal, no breakfast, and then that 16 minims of oleum chenopodii be placed on sugar, divided into three parts, the portions being taken at hour intervals. Two hours after the last dose is administered, he gives 17 grams of castor oil and 3 grams of chloroform. He states, however, that if there is any objection to taking castor oil, it may be omitted and only a slight decrease in the efficiency will result. Schüffner is also of the opinion that oil of chenopodium is one of the most effective vermifuges for roundworms, *Oxyuris vermicularis* and tapeworms, and that the method of giving it on sugar makes it easy, pleasant and agreeable to take.

On account of the fact that one treatment for hookworm results in a "negative" case much more frequently than with other drugs, he is hopeful that the use of chenopodium will be of considerable aid in reducing the sources of infection, and will thus materially advance matters from a public health standpoint.

Dr. Jonge of Medan, Sumatra, who has had a large experience with chenopodium, states that he has seen one case of nephritis which might have been due to chenopodium, but that it soon cleared up.

Dr. Weiss, the physician in charge of the 700-bed hospital of the Holland-American Company at Kisaran, Sumatra, has treated over 5,000 cases of hookworm with chenopodium with the same satisfactory results mentioned above. In one instance he had a case of nephritis which he thought might have been due to chenopodium.

The oil of chenopodium used in Malaya was obtained from well-known pharmaceutic houses in England, that used by Dr. Weiss at Detroit, and the balance used in Sumatra, in Leipzig, Germany.

SUMMARY

Physicians of the Orient have recently treated with oil of chenopodium over 100,000 cases of hookworm

of both the Old and New World type, with greater success than with remedies heretofore employed, and with practically no untoward effects. In Sumatra, where the most cases were treated, the physicians state that the oil of chenopodium is also one of the best drugs against roundworms, tapeworms and whipworms.

Infestation with roundworm is almost universal in the tropics, so that the psychic effect on the patient, produced by expelled roundworms which he may readily see, as against the negative effect produced by hookworms which he usually does not see, is a most important administrative asset in conducting hookworm campaigns on a large scale.

725 Southern Building.

LIGATION OF THE SPLENIC AND GASTRO-EPIPLOICA SINISTRA ARTERIES IN THE SURGERY OF THE SPLEEN

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Nothing may be more difficult than the exposure and control of the vessels in the pedicle of an enlarged or adherent spleen; the application of clamps or ligatures is often very uncertain; if hemorrhage does occur, it may be impossible to check it completely until after the spleen has been removed.

I believe that ligation (either temporary or permanent) of the arterial supply of the spleen at certain points which are more accessible than the deeply situated splenic pedicle will greatly facilitate matters in difficult splenectomies. These points are (1) the splenic artery close to the celiac axis, and (2) the gastro-epiploica sinistra where it reaches the stomach wall from the splenic artery.

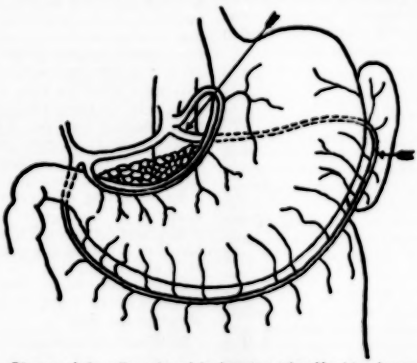

Diagram of the celiac axis and its branches (after Morris). Arrows point to sites for ligation of the splenic artery close to the celiac axis and the gastro-epiploica sinistra where it joins the stomach wall after leaving the splenic artery.

The celiac axis is readily exposed through an opening in the lesser omentum just above the lesser curvature of the stomach; (it may be made to come within an inch or so of the anterior abdominal wall by hyperextending the patient's spinal column by means of the elevator of the operating table commonly used for flexing the trunk in kidney and gallbladder operations). Fully 2 inches of the splenic artery lie just beneath the posterior parietal peritoneum; ligation here certainly offers no difficulties. This, however, does not shut off the entire arterial supply of the spleen because of the free anastomosis of the gastro-epiploica sinistra (branch of the splenic) with the gastro-epiploica dextra (as shown in the accompanying illustration). It is proposed, therefore, that the gastro-epiploica sinistra be ligated where it reaches the stomach wall and just before it begins to send off branches to the anterior and posterior surfaces. Although this point is not so accessible as that just described in the course of the splenic, it is nevertheless readily brought into view by drawing the stomach and left margin of the great omentum over to the right. Theoretically the vasa brevia should also be ligated, but their anastomotic communications on the stomach wall with the gastro-epiploica sinistra (proximal to the point of ligation) will rarely be of sufficient magnitude to demand this. While cessation of the arterial stream does not afford absolute hemostasis, the hemorrhage from the torn veins alone is easier of control and is certainly less than if it came from both arteries and veins.

After the spleen has been removed, the bleeding points in the stump of the pedicle can easily be recognized and ligated. If the ligatures on the splenic and gastro-epiploica sinistra are merely temporary, they are now gradually released in succession so that if any arterial branches in the pedicle have been overlooked, they can be caught and tied. On the other hand, if the two ligatures just referred to are left in place, the pancreatic and vasa brevia branches of the splenic will be permanently put out of commission. This should not lead to serious consequences, because the pancreas will still have a good arterial supply through the pancreaticoduodenales superior and inferior, while the vasa brevia anastomose with branches of the gastro-epiploica sinistra (which, in turn, freely anastomoses with the gastro-epiploica dextra).

LIGATURE OF THE SPLENIC ARTERIAL SUPPLY AS A SUBSTITUTE FOR SPLENECTOMY

Lanz[1] of Amsterdam cites the case of a man of 24 having a wandering spleen, the size of a man's fist, firmly fixed in the true pelvis to the left of the promontory by dense adhesions. It gave rise to severe pain both on urination and on defecation. On account of the extensive adhesions, ligation of the vessels was considered. Rather than ligate all of these (for fear of necrosis of the organ), it was determined simply to ligate the splenic artery. Six months later, bimanual examination of the pelvis failed to reveal any trace of the tumor.

Lanz suggested that ligation of the splenic artery might suffice in cases in which splenectomy was indicated, but mechanical considerations rendered this difficult. I believe that ligation of the spleen's arterial supply, as described above, is simpler, less shocking, and much more certain than an attempt to ligate the vessels in the pedicle when this is deeply situated and difficult of access.

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1. Lanz: Zentralbl. f. Chir., 1914, p. 228.

REFLEX OF THE UPPER EXTREMITY

AN UNDESCRIBED SIGN *

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The lack of a sign or reflex in the upper extremity in any way comparable to the knee jerk has always seemed to me to be a real neurologic tragedy. Consequently the search for such a sign has held my interest strongly.

During a poliomyelitis epidemic in Los Angeles five years ago the first idea of the sign which is the subject of this paper was secured. Since then enough material has been studied to warrant this preliminary report.

There is little to be found in the literature bearing on the subject. A German and two French students have studied the tonus in the flexors of the fingers under pathologic conditions. The methods described do not seem to me to be delicate enough to give very much real information. The method now to be described has at least the merit of extreme delicacy to commend it. The estimate of tonus in the flexor muscles of the fingers gained by this method is more precise than that given by any other method of clinical examination known to me. In my experience it makes more possible than heretofore the very early discovery of evidence pointing toward unilateral lesions, either central or peripheral, as for instance a decreased tonus in an oncoming poliomyelitis, or an increased tonus in an arm affected by a developing brain tumor.

TECHNIC FOR STUDYING THE SIGN

First, it will be noted that the position of the normal human hand when at rest includes slight flexion of all the joints of all the fingers; the hand is one third or one half clenched. The sign I am describing consists in a study of the muscular tonus responsible for this flexion in the normal hand, together with a comparison of the tonus in pathologic conditions.

The sign is elicited by a sudden extension of the semiflexed fingers, producing an excitation in the muscles. This seems to be quite analogous to that produced by tapping the patellar tendon. Foreign observers have attempted to do this by taking hold of the fingers and giving them a sudden twitch. This method will elicit the more severe hypertonic conditions, such as are found in old hemiplegias, for instance. But it will not give the finer differences observable by my method. The knee jerk is primarily an ocular demonstration, while this sign is to be felt rather than seen.

1. Extend hand to be examined on the forearm enough to take up the "slack" in the finger flexors. Do this by laying your hand flat against the patient's palm and pushing it back to as great an angle as possible with the forearm. If you have placed your hand so that it lies crosswise of your patient's hand you will find that his fingers are curling down over your hand.

2. While still retaining the tension on the flexors in the above-described manner, move the examining hand very sharply along the palm toward and against the curling fingers. Do this several times in quick succession. In this way a very accurate concept of the tonus in the flexors is obtained. Compare the two sides.

A trial of this method on a small number of normal hands will serve as a basis for estimating pathologic tonus. Carrying it out very rapidly time after time will usually overcome the self-consciousness of the patient and his efforts to help in the examination.

Tonus of the flexors of the fingers when tested by this method is found to be decreased uniformly in poliomyelitis involving the upper extremity. This is also true of polyneuritis. In a long series of cases of tabes dorsalis examined in the National Hospital in London last summer and in other places this reaction or reflex was found to be absent or much diminished in the majority of cases. A very frequent combination found in this series was absent knee jerks, elbow and wrist jerks present, and flexor tonus diminished.

In central lesions, on the other hand, this sign is uniformly positive. Wherever organic hemiplegias, for instance, show positive reflexes, this reaction is positive. The probable value of the sign lies in the fact that at times it can be demonstrated unusually early in the symptomatology of central lesions; that is, an increased tonus develops. Thus it has been noted in brain tumor when no other localizing signs could be found except diminished abdominals and epigastrics. A true finger flexor clonus has also been found occasionally in upper lesions.

A study of the physiologic questions involved in this sign leads me to conclude that the stimulus given to the flexor muscles by this method of sharp and sudden straightening of the fingers is of the same order and quite comparable to the stimulus caused by tapping the patellar tendon. Certainly it has reacted at all times quite parallel to the knee jerk in my experience. If it can be interpreted as showing in the upper extremity what the knee jerk tells us in the lower, its value will be fairly established. One thing is sure: a little practice with this sign will persuade the careful observer that infinitely more delicate differences in muscular tonus can be detected by this technic than by any of our ordinary methods.

In perfecting this technic it has been the custom to examine for the sign in every case seen. In this way it has been determined that relative strength in the two hands of a normal subject has no influence on the sign. It is also found that the normal tonus is different in different individuals. Relative training of the hands, as pronounced right or left handedness, is without effect on the sign.

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* Read before the Section on Nervous and Mental Diseases at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

FLUOROSCOPIC BRONCHOSCOPY

WITH CASE REPORTS AND ONE BY DR. STANTON A. FRIEDBERG *

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This operation is indicated in all cases in which a foreign body that casts a shadow cannot be extracted by the ordinary methods, but especially in the following classes: first, those in which the mucus, pus or blood is so abundant that the foreign body cannot be seen; second, those in which granulation tissue prevents inspection; third, those in which the body is hidden in an abscess cavity; fourth, those in which a stricture prevents inspection, and fifth, difficult cases

* A detailed description of operation will be published in the Transactions of the American Laryngological Association for June, 1915.

in which the foreign body is lodged in a bronchus where it cannot be exposed by ordinary methods.

CASE 1.—A man supposed to have been suffering from stomach trouble for nearly two years was finally sent to the Silver City Sanitarium for tuberculosis, where Dr. Bullock with the Roentgen ray found a nail that was lodged in an abscess cavity in the lung between the fifth and ninth ribs. Great irritability of the throat prevented ordinary bronchoscopy. The depth of the foreign body in the lung, the abscess cavity and the large amount of purulent secretion rendered fluoroscopic bronchoscopy necessary. Assisted by Dr. Friedberg with the aid of the fluoroscope, I introduced first the bronchoscope to locate the bronchus from which the pus was escaping, and through this passed narrow strong tube forceps, guiding them down to the foreign body by the shadows. The end of the forceps was moved back and forth laterally until I had determined that it was in the same cavity with the foreign body. The latter was then grasped firmly and brought out at the same time as the bronchoscope.

CASE 2.—A boy, aged 5, who had inhaled a part of a rivet about eight months previously, had afterward suffered from stomach symptoms until shortly before he was brought to me, when he developed a pleurisy. Dr. Goodkind demonstrated the presence of a foreign body with the fluoroscope. Aided by Dr. Friedberg, I did a bronchoscopy by which I located a stricture above the foreign body. By means of the fluoroscopic shadows, I passed the forceps and soon succeeded in catching the metal, which was drawn out with the bronchoscope. Both patients did very well afterward. In neither could the body have been removed by the ordinary methods.

CASE 3.—Dr. Stanton A. Friedberg's patient, in whose case I aided in a fluoroscopic bronchoscopy, was a girl, aged 12, who had aspirated a brass-headed upholstery tack seven weeks previously. Tracheotomy had been done, and two attempts at removal had been made before Dr. Friedberg saw the patient. He had made an additional trial before the patient was brought to Chicago. May 11, bronchoscopy was performed with the aid of the fluoroscope. The tack was found in a cavity below a stricture of a secondary bronchus on the right side. It was removed without especial difficulty. No ill effects were experienced from the operation, which was done without anesthesia.

104 South Michigan Avenue.

A CASE OF PRIMARY DIPHTHERIA OF THE SKIN *

LUDWIG A. EMGE, M.D.
CHICAGO

L. B. V., an intern in this hospital, Oct. 4, 1914, while intubating a small child, was bitten in the knuckle of the left index finger. October 6, the wound became sore and red. The following day a small ulcer was present and there was considerable hyperemia and infiltration about the knuckle. Hot, moist dressings were applied, which gave relief, but the wound continued to discharge a little. October 11, a thin layer of grayish pus was present. On the morning of this day, the throat became sore and there was considerable fever; the infiltration of the finger also became more active. The patient was isolated, but the throat cultures, October 11, 12 and 13, showed streptococci only. During these days inflammation of the wound was very active in spite of vigorous local treatment. October 14, pus from the wound was found to contain diphtheria bacilli in culture, but at the same time the throat was free from these bacilli. This was true also, October 15. The epidermis separated from the underlying tissue over an area of about 1 cm. in diameter, and red granulations beneath discharged a small amount of thin, grayish pus; there was never a complete covering of fibrinous exudate. October 15, the patient was given 5,500 units of antitoxin, and on the next day cultures from the throat showed a few diphtheria organisms. The patient was immediately given 10,000 units more. The temperature returned to normal within two days, except for an evening rise which persisted during the entire course of the disease and which was explained by the presence of foci of tuberculosis in the lungs. Cultures from the finger, October 28, were negative for diphtheria bacilli, which persisted in the throat to November 11.

The finger was treated by the application of 5 per cent. phenol (carbolic acid) after freshening the edges of the wound, thorough washing with 50 per cent. alcohol, and a weak alcohol dressing. A 1 per cent. ointment of yellow mercuric oxid was applied when the wound began to heal.

Reports of cases of diphtheria of the skin in various forms have appeared now and then in the literature. Two very complete reviews of the subject have been published recently by Bertelli[1] and by Knowles and Frescoln.[2] In all there are about a hundred cases reported. Many are not actually primary diphtheria of the skin, but developed after throat infection.

No doubt the case reported here is one of primary diphtheria of the skin, since the cultures from the throat were negative for several days, while those of the finger gave typical diphtheria bacilli. There are very few cases on record in which the history of contagion gives the source of infection so clearly as in this case. It shows that skin abrasions in persons coming in close contact with cases of diphtheria should receive immediate attention.

* From the Durand Hospital of the Memorial Institute for Infectious Diseases.

1. Bertelli, G.: Sulla difterite cutanea, Gaz. d. osp., 1914, xxxv, 1035.
2. Knowles, F. C., and Frescoln, L. D.: Diphtheria of the Skin of Unusual Types, THE JOURNAL A. M. A., Aug. 1, 1914, p. 398.

REPORT OF A CASE OF INTUSSUSCEPTION

W. C. GATES, M.D., BUCYRUS, OHIO

Mrs. C. H., aged 66, May 11, 1914, was taken with severe pain in the abdomen. Morphin was used freely, but no diagnosis made. Her condition became steadily worse until the 19th. By persistent use of high enemas in the knee-chest position, a large movement was secured, with relief of many of the symptoms. Just after this a hard lump was noticed in the right hypochondriac region which had been diagnosed as a floating kidney. The patient did not improve. I was called in consultation, and saw her first, June 6. There was a hard, freely movable tumor in the region of the pylorus which I did not think was a kidney. I urged operation and was dismissed. She did not improve, and drifted from one physician to another.

She was brought into my hospital, August 3, nearly three months after she was taken sick, in an apparently dying condition. Nothing could be felt in the right abdomen, but low down on the left side there was a large, firmly fixed, sausage-shaped tumor. On opening the abdomen, I found the lower portion of the ileum, the cecum, and the ascending and transverse colons invaginated into the descending colon, and the entire mass gangrenous and sloughing. I amputated the lower portion of the ileum, and the ascending, transverse and descending colons as quickly as possible, making an end-to-end anastomosis between the ileum and the upper portion of the sigmoid, because it was the quickest procedure in this particular case.

The woman made an uninterrupted recovery, and was dismissed from the hospital four weeks later. She gained rapidly in weight until she exceeded her former weight. At the present writing, nearly one year later, she is having a normal bowel movement every day and is feeling better than she has for several years past. I report the case because, although intussusception is common in children, I have never met or read of one in a person of this age; again, I have never known one to exist for such a long period of time, nearly three months, or a patient with one to recover when in such an apparently hopeless and desperate condition.

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SATURDAY, AUGUST 7, 1915

PRESENT-DAY METHODS OF PASTEURIZING MILK

Few features of our industrial activities have experienced more progressive changes in recent years than those associated with the food industries. A few years ago, to cite a specific illustration, all of the milk sold to the public was "dipped." Then came the bottling of milk, the clarifying of this product, along with numerous now familiar procedures in handling it. The improvements in general sanitation surrounding the production and distribution had reached a point in 1900 at which the value of sanitary precautions for the keeping qualities of milk forced attention. Three American dairy farms exhibited raw milk at the Paris Exposition of that year, one of them sending weekly shipments throughout the summer, each of which was kept on exhibition without spoilage until the next shipment arrived. It was difficult, according to Sherman's account,[1] to convince the jury of European experts of the fact that cleanliness and cold were the only preservatives needed to accomplish the keeping of raw milk in a fresh sweet condition for two or four weeks in midsummer.

These possibilities are embodied in the certified raw milk of the present decade, although less than 1 per cent. of the market milk of commerce is of this grade. Under the prevailing conditions, which are too familiar to require detailed discussion, pasteurization of milk is making an increasing appeal to those who are interested in the dangers of deterioration whereby milk becomes unwholesome, and of the possibility of spreading specific infectious disease thereby. Various aspects of the problems of pasteurization have already been discussed in THE JOURNAL.[2] The latest innovation, following the growing tendency of public health authorities to urge the pasteurization of all market milk which is not obtained under good sanitary conditions, is pasteurization in sealed bottles. The principles applied are similar to those obtaining in the pasteurization of bottled beer. Inasmuch as it introduces an added item of expense which is not inconsiderable, unless the pasteurization in bottles is carried out on a very large scale so as to permit the use of commercially feasible apparatus, the problem of utility has been raised.[3]

The sterilization or partial sterilization of milk in bottles is not a new procedure, as those who are familiar with the early work of Soxhlet will recall.[4] Pasteurization, however, in the sense of heating milk to a temperature of from 60 to 63 C. (140 to 145.4 F.), and holding it at this temperature for from twenty to thirty minutes, is ordinarily carried out on milk in bulk. The product is rapidly cooled by passing over chilled surfaces, and then bottled in steamed bottles. The newer process of pasteurization in bottles is already in use in a number of milk plants throughout the country. The assumed advantages of this process, from the bacteriologic standpoint, lie in the fact that reinfection after pasteurization is prevented when no further transfer into containers is to be carried out.

The proper handling of milk in the ordinary method of pasteurization in bulk reduces and may prevent subsequent reinfection; but amid the imperfection of human performances, the possibility still remains. The experts maintain that the process of pasteurization in bottles effects a great saving in milk by doing away with loss in evaporation over the coolers, and with other losses connected with pasteurizing apparatus. Ayers and Johnson,[3] of the Bureau of Animal Industry, have added a further presumably satisfactory procedure to the methods now available. It consists in pasteurizing milk in bulk in the usual way, but in bottling it hot in special oversized milk bottles of the ordinary type and capped with ordinary sterile caps.

Extensive bacteriologic investigations made in the government laboratories[3] show that the process of bottling milk while hot in hot steamed bottles causes equally as good bacterial reductions as does pasteurization in bottles. It seems probable to Ayers and Johnson that if milk thus bottled is cooled from the pasteurization temperature to 50 F. within five hours, no more bacterial increase will take place during the slow cooling than would take place if the milk were cooled immediately to 50 F. Inexpensive air cooling thus becomes applicable. The coming year will perhaps witness a comparison of the two newer processes, namely, pasteurizing milk in bottles and bottling hot milk pasteurized in bulk.

1. Sherman, H. C.: Food Products, 1914, p. 53.

2. Efficient Pasteurization and the Bacteria Which May Survive It, editorial, THE JOURNAL A. M. A., May 10, 1913, p. 1462; Chemical Changes Produced in Cow's Milk by Pasteurization, Current Comment, Aug. 23, 1913, p. 605; The Prevention of Infantile Scurvy, editorial, March 6, 1915, p. 835; Pasteurization of Milk and the Colon Bacillus, May 22, 1915, p. 1767.

3. This question has been investigated extensively by the Dairy Division of the Bureau of Animal Industry in Washington. See Ayers, S. H., and Johnson, W. T., Jr.: Pasteurizing Milk in Bottles and Bottling Hot Milk Pasteurized in Bulk, U. S. Dept. Agric. Bull. 240, Professional Paper, July 13, 1915.

4. Soxhlet, F.: Ein verbessertes Verfahren der Milch-Sterilisirung, München. med. Wchnschr., 1891, xxxviii, 335.

TESTS IN THE DIAGNOSIS OF CANCER

There seems to exist at the present time a singular readiness on the part of the medical profession to take up every new diagnostic test as soon as it is proposed. This enthusiasm and the uncritical attitude which accompanies it may perhaps be due to the fact that a number of chemical and biologic reactions introduced into medical diagnosis in the past decade have performed singular and successful service. The search for helpful tests in the diagnosis of cancer has been particularly active, because of the large number of scientific workers interested in the problems of this disease, and of the splendid resources that have been put at the command of the investigators in almost every civilized country. Many times a few seemingly positive data have paved the way for very favorable reports as to the efficiency of some new test, only to be followed by most discouraging condemnation when the field of application was more carefully scrutinized or the statistics were enlarged by a suitable number of observations.

Among the urinary tests that have been suggested of late for the early diagnosis of cancer, two have been made the subject of a critical study at the biochemical laboratories of Columbia University and the Beth Israel Hospital in New York City by Goodridge and Kahn.[1] One of the proposed tests, the colloidal nitrogen reaction, has been carried out differently by the various investigators who have applied it. Some have precipitated the "colloidal" substance from the urine with alcohol, others with zinc sulphate. The product obtained in this way is frequently unusually large in amount in certain individuals. Although this increase frequently applies to the urine of carcinomatous patients, a high colloidal nitrogen index has been reported by competent analysts in connection with such heterogeneous diseases as myocarditis, diabetes, leukemia and anemia.[2]

Equally divergent are the results recorded with the neutral sulphur test proposed by Salomon and Saxl.[3] This consists in estimating the fraction of the urinary sulphur compounds that are not present as preformed sulphates, but can be liberated by means of hydrogen dioxid and then determined. The value of the newer comparisons by Goodridge and Kahn lies in the large number of cases drawn into consideration: twenty-two normal, fifty-nine cancerous, and forty-seven individuals otherwise diseased. Earlier investigators[4] have made the statement that "it is a precarious undertaking to diagnose a malignant tumor on the basis of the absolute or relative amount of neutral sulphur in the urine." To this may be added the latest verdict that positive results with either the colloidal nitrogen test or the neutral sulphur test, alone, are not indicative of carcinoma. Goodridge and Kahn suggest, however, that positive results with both methods, performed conjointly on urine of the same case, are strongly indicative of malignancy.

1. Goodridge, F. G., and Kahn, M.: The Neutral Sulphur and Colloidal Nitrogen Tests in the Diagnosis of Cancer, Biochem. Bull., 1915, iv, 118.
2. Einhorn, Kahn and Rosenbloom: Arch. f. Verdauungskr., 1911, xvii, 557.
3. Salomon and Saxl: Deutsch. med. Wchnschr., 1912, xxxviii, 58.
4. Stadtmüller, Norbert, and Rosenbloom, Jacob: Studies on Sulphur Metabolism, I, The Urinary Sulphur Partition in Various Diseases, Arch. Int. Med., September, 1913, p. 276.

THE LOSSES OF WEIGHT IN THE NEWLY BORN

Familiar statistics show that newly born infants almost invariably experience a decline in body weight during the first few days of their extra-uterine existence. The recovery from this loss, to which scientific attention appears to have been directed first by Chaussier nearly a century ago, usually begins at about the third or fourth day of life. The actual extent of loss of weight varies within rather wide ranges and may be placed, in round numbers, at from one fifteenth to one seventeenth of the original body weight.

The cause of this phenomenon has been the subject of considerable speculation. The interpretation has an aspect which is not confined to the theoretical interests alone. If the characteristic loss of weight is something normal and inevitable, our attitude toward it in a practical way may be tolerant and satisfied; but if it represents an abnormality of function, the possibility of corrective measures at once suggests itself to the ambitious scientist and the practical pediatrist.

At the outset it may be noted that the loss of weight in the newly born, though not observed in all individuals, is by no means confined to the human species. Long ago Edlefsen recorded an average decline of 4 per cent. of the initial body weight in the early existence of guinea-pigs, which are commonly born well developed in form. Doubtless the same incidents might be observed in other newly born animals, if observations were made promptly and repeated at frequent intervals during the earliest period of postnatal existence.

There is substantial agreement as to the nature of these early losses sustained by the human infant. They consist for the most part of water, represented by insensible perspiration and respiratory products in addition to the very considerable content of water in the meconium and scanty urine of the first day or two of life. The actual extent of the decline appears to be modified by a number of factors, of which the most prominent may be summarized as follows:[1] (1) the degree of development or maturity of the infant; (2) the actual weight at birth; (3) the milk supply of the mother. If, as has often been maintained, the initial fall in body weight is the expression of a lack of suitable nutriment from the mother at the very beginning

1. Benestad, G.: Wo liegt die Ursache zur "physiologischen" Gewichtsabnahme neugeborener Kinder? Jahrb. f. Kinderh., 1914, lxxx, 21.

of the period of lactation, it would be rational to afford an extra supply of breast milk, where possible, so as to avert a nutritive decline until the secretory performance of the maternal organism has become adjusted to its new functions. There is evidence,[1] however, that the loss of weight cannot be averted by such a procedure any more than by furnishing artificial food mixtures supposed to be suitable to the exigencies of the occasion. It might be supposed that the infants of multiparas would fare better than those of primiparas, because of the better adjustment of milk supply to infantile demands. This has not been demonstrated in practice, nor has an inability of the newly born child to secure nutriment been conclusively proved. Children fed abundantly with artificial mixtures sometimes experience the extremest losses of weight.

There are, of course, cases in which pathologic incidents, such as local affections of the mammary gland, obviously interfere with adequate nutrition. Aside from such undeniable abnormal causes of loss of weight, the explanation of so-called "physiologic" decline must presumably be sought in some factor other than mere lack of food. At any rate, part of the controversy hinges around this aspect of the question. One is thus led to inquire as to what other causal phenomena might be brought into play in the first few days of life. It has accordingly been suggested that the newly born are, to some degree, damaged by the very act of birth. The compression of the skull and brain, and other attendant consequences have been regarded as provocative of an abnormally somnolent condition leading to indifference to food. In reply to this, it is remarked that even those infants which experience the least detriment, as the result of an easy birth, are subject to the "physiologic" loss of weight.

Another view, though by no means a new one, attributes the weight changes to the unpreparedness of the newly born organism to digest and metabolize its nutriment adequately. Not long ago it was widely taught that some of the normal equipment of the alimentary tract for the work of digestion was only gradually acquired. This was maintained, for example, to be true of the amylolytic functions; and for this reason the use of starch in the food of young infants was regarded as theoretically objectionable. The more recent investigations of the gastro-intestinal canal and its secretions in the very young, by the more refined technic of the chemical physiology of today, with its abundance of methods for the demonstration of diverse enzymes, have made some of the older statements untenable.

Dr. Benestad[1] of Christiania is among those who maintain that the presence of a variety of enzymes in the alimentary apparatus of the newly born is no guarantee that they are produced from the start in quantities sufficient to accomplish the work of digestion. He points to the alleged escape of incompletely disintegrated fragments of the protein molecule in the urine of early life as an evidence of inadequate gastro-intestinal performance. We are further reminded that it is the infant most mature at birth which appears to withstand the tendency to loss of weight most promptly. A small loss is accordingly prognostic of favorable progress. From a practical point of view, if the foregoing conclusion as to the cause of the early transitory loss of weight in infants is valid, the effort to force nutrients on an unprepared organism has no advantage. The policy of watchful waiting for development finds its justification.

THE COMPLICATIONS OF VACCINATION

The efforts of health authorities to promulgate vaccination are often opposed by the argument that the complications of vaccination may be of more moment than an attack of smallpox. The low mortality rate of the type of smallpox which now prevails, as a rule, in this country, is cited, and attempts are made to magnify — unduly it would seem — those infections which sometimes occur in the vaccinated at or about the time of vaccination.

Among the most frequently mentioned complications is tetanus occurring within two to three weeks after vaccination. Another infection which has been attributed by the antivaccinationists to contamination of the vaccine virus is poliomyelitis; in a certain state, the opponents of vaccination have claimed that in a number of cases the poliomyelitis infection was received through vaccine virus. To any one conversant with the nature of the virus of poliomyelitis, such an assertion is not credible for certain very evident reasons, the chief of which is that all attempts to produce poliomyelitis in the bovine species (as well as in animals other than monkeys and perhaps rabbits) have been unsuccessful. Therefore, no way appears in which the vaccine virus now prepared from calves could receive the infection of poliomyelitis, as has been shown possible with the infection of foot and mouth disease. Even if this were not so, moreover, the slight scarification of a vaccination wound would offer but little chance for the entrance of the infection into the human body.

It has not been so easy to explain the absence of any relation between the vaccine virus and the occasional case of tetanus occurring two or three weeks subsequent to vaccination. This subject has recently been considered in a paper read by Anderson[1] before the Association of American Physicians in Washington. The data presented were grouped under several headings. First was the experimental evidence of Francis,[2] in which he showed that when monkeys (which are susceptible to both vaccinia and tetanus)

1. Anderson, John F.: Studies on the Relation Between Vaccine Virus and Postvaccination Tetanus, Pub. Health Rep., July 16, 1915.
2. Francis, Edward: Laboratory Studies on Tetanus, Bull. 95, Hyg. Lab., U. S. P. H. S.

are vaccinated by multiple insertions with virus heavily contaminated for the experiment with tetanus spores, those animals failed to develop tetanus. Also that guinea-pigs vaccinated with virus purposely contaminated with tetanus did not develop tetanus. From these laboratory experiments the conclusion was drawn that it is difficult, if not impossible, to produce tetanus in susceptible animals by vaccination with virus containing large numbers of tetanus organisms which had been intentionally placed therein.

The other data presented were largely of a statistical nature, but convincing. During the past thirteen years, Anderson states, there have been examined in the Hygienic Laboratory, specifically for tetanus, vaccine virus sufficient for the vaccination of over 2,000,000 persons, and in no instance was it possible to demonstrate the presence of the tetanus organism or its toxin in any of the virus examined. This is of special significance in view of the fact that the methods in use have been so refined that it is possible, in practically all instances, to detect these organisms in virus when known to be present.

Inquiry of the makers of vaccine virus showed that during the last eleven years there have been used in the United States over 31,000,000 vaccines; yet Anderson was able to obtain information of only forty-one authenticated cases of tetanus developing after vaccination during that time. If the virus had been at fault, it certainly would seem reasonable to conclude that among so large a number of vaccinated persons more cases of tetanus should have occurred.

According to the records of the medical department of the United States Army and Navy, there were 585,000 soldiers and sailors vaccinated from 1904 to 1913, inclusive. During this time there were but six cases of tetanus in the army and two in the navy, in none of which was there the least reason to believe that vaccination had any relation to the tetanus. As the virus used in the army and the navy is the same as that used throughout the United States, these figures have a special significance as supporting the view that the occasional case of tetanus developing after vaccination is not due to infection received through the virus. Forty-one cases of tetanus occurring after vaccination were investigated, and it was found that the average incubation period, if counted from the time of vaccination to the onset of tetanus, was twenty-two days. Twenty-nine of the cases resulted fatally, thus giving a case mortality of 70.7 per cent. The case mortality of Willson's fifty-two cases was 78.8 per cent., while the average incubation period of his cases was 19.4 days.[3]

These figures, as to the incubation period and case mortality, when compared with similar data for tetanus from other causes, point strongly to the probability of a true incubation of ten days or less, and hence to the belief that the infection of tetanus was not received at the time of vaccination (therefore not in the virus), but in some other way ten days or more after the operation.

Anderson's conclusion was that cases of tetanus occurring fifteen or twenty days after vaccination do not receive their infection through the vaccine virus, but that in all probability the infection is received after vaccination by a contamination of the vaccination wound such as may occur in the infection of any other surgical wound not properly cared for.

References have been made repeatedly to the importance of the proper care of vaccination wounds and to the failure of many physicians to give this minor surgical operation the care it deserves. The complications of vaccination can be greatly reduced, if not entirely avoided, by the use of proper technic in vaccination and in seeing that the wound and "take" are properly looked after. Every physician who does a vaccination should see the patient at least once after the development of the vesicle to satisfy himself that the wound is properly cared for.

Vaccination is a surgical procedure, and is worthy, not only of the painstaking asepsis of a skilled physician at the time of operation, but of his intelligent after-care as well.

3. Willson, Robert N.: An Analysis of Fifty-Two Cases of Tetanus Following Vaccinia, with Reference to the Source of Infection, 1839-1902, THE JOURNAL A. M. A., May 3, 1902, p. 1147, and May 10, 1902, p. 1222.

CAUSES OF DEFECTIVE PRENATAL DEVELOPMENT

The results obtained by Stockard[1] from breeding, in various combinations, animals whose ancestors were exposed to long periods of intoxication from inhalation of alcohol fumes have again aroused interest in certain problems of parental pathology. Stockard found that the results of matings of apparently normal animals of alcoholic parentage deteriorate in a marked degree with each successive generation. There is a relative increase in the stillborn litters, an increase in the death rate of the living young and an increase of animals with congenital defects of the eyes in the third generation as against the second.

What is the explanation of monstrous or defective development, of which experimental illustrations have just been cited? Mall's studies of pathologic human embryos[2] has led him to assume that the defective development is due to a condition of "faulty implantation" of the ovum in the wall of the uterus. This defective process may perhaps be occasioned by a diseased condition of that organ so as to make the

1. Stockard, C. R.: Arch. f. Entwcklngsmechn. d. Organ., 1912, xxxv; An Experimental Study of Racial Degeneration in Mammals Treated with Alcohol, Arch. Int. Med., October, 1912, p. 369; Am. Naturalist, 1913, xlviii; Proc. Soc. Exper. Biol. and Med., 1914, xi, 136. Inherited Defects Attributable to Alcohol, Current Comment, THE JOURNAL A. M. A., Oct. 17, 1914, p. 1400.

2. Mall, F. P.: A Study of the Causes Underlying the Origin of Human Monsters, Jour. Morphol., 1908, xix.

adequate nutrition of an improperly implanted ovum impossible and eventually lead to death or to monstrosities. A healthy ovum may thus be conceived to give rise to a monster when discharged into a diseased uterus in which it fails to become properly implanted.

Hertwig had suggested earlier that the formation of monsters in human beings may possibly be due to the presence of certain poisons, such as alcohol or toxins, in the blood of the mother. This is, of course, in harmony with the findings that the developing egg of lower forms of animal life, when subjected to changes in its chemical environment, results in an ovum which deviates from the normal. Werber[3] was led to approach the question more closely by selecting, as his injurious substances, compounds known to arise in the faulty metabolism of man, and therefore thought to be more likely to cause pathologic development of the embryo in the uterus of a mother whose metabolic functions have been seriously impaired. From this standpoint, butyric acid and acetone have already given definite results in trials on the fertilized eggs of the marine teleost fish *Fundulus heteroclitus*. Deformities of the most varied type, such as cyclopia, defects of the ear vesicles, hydrocephalus and defects of the circulatory apparatus, have been produced.

It is surely a long step from such experiments, highly interesting as they are in themselves, to the related possibilities in man. It is permissible, however, to wonder whether or not variations in the quantity of toxic metabolic products in gravid females may account for the variations in the degree of injury exhibited by defective embryos aborted at different periods of gestation, or even for some defects found after full-term births in individuals which have an otherwise normal appearance. The imagination of the scientist may properly wander in the realms between fact and fancy; but generalizations of medical significance regarding the possible relation of defective development to intrauterine or preuterine poisoning by metabolic products cannot be warranted until crucial tests have been conducted on a mammalian organism.

3. Werber, E. I.: Is Pathologic Metabolism in the Parental Organism Responsible for Defective and Monstrous Development of the Offspring? Bull. Johns Hopkins Hosp., 1915, xxvi, 226.

The Ten Commandments for the Wounded.—Professor Lusena has got up a "decalogue" for the Italian soldiers which is being distributed to all the Italian soldiers, some of the daily papers having printed it in card form. The instructions emphasize the importance of never touching a wound with the fingers or any object except the contents of a first-aid packet or its equivalent. No attempt should be made to wash the wound, but if tincture of iodin is at hand it should be applied inside the wound. The wound should be covered immediately with gauze from the first-aid packet. Bleeding should be arrested by a tourniquet but stress is laid on the importance of hastening to obtain medical care as soon as possible, and that if constriction is applied for more than two hours at most, gangrene is liable to follow. The decalogue is given in full in the *Policlinico*.

Current Comment

PUBLICITY IN LEGISLATION

Last week THE JOURNAL commented on the action of the *Ohio State Medical Journal* in giving publicity to the way the members of the Ohio legislature at its recent session voted on bills relating to health matters. Our attention has been called to the fact that we should have mentioned similar action on the part of the *Journal of the Missouri State Medical Association* on the "optometry" and "chiropractic" bills, the Missouri journal printing the vote on these bills in the April and May issues. Both journals are to be commended for their enterprise, which might be profitably imitated by lay as well as medical journals. Publicity puts a wholesome curb on wrong or careless action of legislators, and is especially desirable in matters of such vital import to the people as legislation concerning health.

LABORATORY INFECTIONS WITH THE TYPHOID BACILLUS

The fact that typhoid fever is a disease which cannot be successfully communicated to the ordinary laboratory animals makes peculiarly valuable the record of human infections with pure cultures of the typhoid bacillus. No summary of such cases seems to have been made, however, until Kisskalt[1] recently undertook to gather the available data. In reply to a questionnaire sent out to many German laboratories, information was secured regarding thirty-six cases of laboratory infection with pure cultures and about a dozen more of possible infection with typhoid stools or urine. In ten instances, the accidental taking of typhoid bacilli into the mouth was not followed by infection; immediate and vigorous methods of mouth disinfection were practiced in all these instances. While it is plain that data collected in the manner mentioned are not above criticism, there are several interesting points which come to light in Kisskalt's compilation. The degree of severity and the mortality rate seem to be no different in the laboratory infections with pure cultures than in typhoid cases contracted in more ordinary ways. The number of bacilli necessary to cause infection could hardly be determined with precision, but it is apparently not large, as in several instances infection occurred even after thorough mouth disinfection. No definite relation could be shown to exist between the virulence of the individual cultures for animals and the severity of the infection in man; a slightly virulent strain could produce a fatal infection, while the taking into the mouth of strains highly virulent for animals did not lead to any illness. Such an outcome might be expected perhaps from the specialized nature of the typhoid bacillus, and it must be remembered also that the question of virulence in such cases is complicated by the entire lack of knowledge as to the number of bacilli actually swallowed. Kisskalt appears to have received the impression from the data which he

1. Kisskalt: Ztschr. f. Hyg., 1915, lxxx, 145.

examined that certain strains of the typhoid bacilli are especially pathogenic for man. The cases are not numerous enough to determine whether the strains cultivated from the blood and spleen are any more virulent than those from the stool. It is interesting to note that there is apparently no relation whatever between the age of the typhoid culture and its virulence for man. Cultures which have been grown for years on artificial mediums evince just as high infectivity and virulence as those recently isolated.

INABILITY OF THE PANCREATIC JUICE TO DIGEST DISACCHARID SUGARS

The growing realization that the foodstuffs are disrupted into much smaller chemical fragments prior to their absorption from the alimentary tract has brought with it a natural desire to learn what forces are at work to bring about this essential complete digestion of the nutrients. The proteins are hydrolyzed to amino-acids by the aid of a number of alimentary enzymes; the fats are split up by lipase into component radicals; the complex food carbohydrates are converted into sugar. Even the relatively simple disaccharids like maltose, lactose and sucrose are transformed into six-carbon sugars in the gastro-enteric tract. The relative participation of the different digestive secretions in this work of alimentary disintegration of the foodstuffs is now almost established. A few gaps or uncertainties in the knowledge of the subject remain to be filled or dismissed. One of these concerns the possible relation of the pancreatic juice to the common food sugars lactose (milk sugar) and sucrose (cane sugar). The hydrolytic cleavage of these carbohydrates is known to be effected easily by the intestinal secretion. Mellanby and Woolley,[1] of the physiologic laboratory of St. Thomas' Hospital in London, have failed in all attempts to demonstrate a similar function of the pancreatic secretion. Despite its relative richness in the variety of enzymes which the pancreas furnishes to the alimentary tract, the digestion of these sugars is now placed outside the province of the pancreatic secretion.

A QUACK'S IMPUDENCE

The impudence of the quack is notorious; monumental assurance is his chief asset. S. R. Chamley — or as he sometimes spells his name, "Chamlee" — is a quack of the "cancer cure" variety. With heartless cupidity he has defrauded the sick for more than a quarter of a century. Declared a fraud by the government and denied the use of the United States mails[2] in St. Louis, where he conducted one branch of his nefarious business, Chamley calmly moved his offices to Chicago. From this city and from Los Angeles he has, apparently, without let or hindrance, continued to defraud the public with impunity. At different times Chamley has been exposed in THE JOURNAL, in *Collier's*, in *Harper's*, in the Chicago *Tribune* and in numerous other publications; he has been prosecuted both by federal and state officials; nevertheless, he has continued to exploit his heartless fraud and today is using, as part of his advertising paraphernalia, a picture of a fifty-thousand-dollar residence, built of blood-money wrung from the hopelessly sick. Now comes Chamley in a letter to physicians with this offer:

"I will take an oath and do hereby affirm that I have made nearly one-half million dollars with my cancer remedy. I am now an old man (63) and will sell it to you for only $20 and teach you by my book and typewritten correspondence to cure cancers on any part of the face and body. It is a most wonderful, strange but fortunate combination of several medicines, easily obtained at any large drug store. I often get $1,000 for curing a cancer and $300 to $500 is very common. . . . Price only $20 for a treatment that I have been making from 20,000 to 30,000 dollars every year for many years. . . ."

As might be expected the theme sustained throughout Chamley's letter is that of low, crafty cupidity. The man's character stands out in the closing sentence of the letter.

"I have just taken a $2,000 case and a $1,000 case all in advance."

Possibly the human animal can descend to greater depths of depravity than that reached by the cancer quack — possibly, but not probably. Of all tainted gold none is quite so dirty as that filched from the hopeless sufferers from civilization's most dreaded scourge.

THE EFFECT OF WORK ON THE BLOOD

Recently, attention was called to evidence that muscular exertion, incident to such performances as running, walking, bicycle riding, swimming and other sports, almost invariably causes an immediate increase in the number of red corpuscles in a unit volume of blood.[1] The removal of water by the sweating and respiration that accompany vigorous exercise doubtless induces concentration of the blood and thus brings about an apparent increment in its cellular elements. It has been noted, however, by Schneider and Havens,[2] that the increment in the number of corpuscles found after muscular activity is so prompt in its appearance as to make it probable, to them at least, that the primary factor in this phenomenon is not the loss of water from the body but the discharge of a large mass of sidetracked corpuscles into the general circulation. Still more recently, Boothby and Berry,[3] at the clinic of Professor Cushing in Boston, have made observations on the effect of work on the composition of the blood, the exercise in these cases consisting in performance on a stationary bicycle. Experimental data are given showing that the percentage of hemoglobin and the number of red blood corpuscles, and therefore

1. Mellanby, J., and Woolley, V. J.: The Ferments of the Pancreas, Part V, The Carbohydrate Ferments of Pancreatic Juice, Jour. Physiol., 1915, xlix, 246.

2. See pamphlet "Cancer Cure Frauds" (price 6 cents), published by the American Medical Association.

1. Exercise and the Blood, editorial, THE JOURNAL A. M. A., May 1, 1915, p. 1501.

2. Schneider, E. C., and Havens, L. C.: Changes in the Blood After Muscular Activity and During Training, Am. Jour. Physiol., 1915, xxxvi, 239.

3. Boothby, W. M., and Berry, F. B.: The Effect of Work on the Percentage of Haemoglobin and Number of Red Corpuscles in the Blood, Am. Jour. Physiol., 1915, xxxvii, 378.

the oxygen-carrying capacity of a unit volume of blood, are increased under conditions of work causing an appreciable amount of perspiration. If no perspiration occurs, there is no such increase. The Boston investigators correlate the increase in blood cells with an alteration in the density of the blood induced by sweating. They regard the results as another interesting example of the intercompensatory mechanism of the human body; for, as they say, it is evident that, in the main, the object of perspiration is to keep the body temperature down under conditions of work; yet its formation and elimination, by increasing the proportion of hemoglobin, increases the carrying capacity of a unit volume of blood, thereby throwing less strain on the circulatory system.

THE SUSPICIONS OF ANTIVIVISECTIONISTS

A sample of the way in which tightly cornered antivivisectionists will manufacture opinion by slyly throwing out suggestive slurs and innuendos is well illustrated in a recent article in the *Open Door*,[1] entitled "Can Vaccination Without Sanitation Prevent Typhoid?" After citing the statistics presented by the United States Army, the author says:

> We accept these figures as correct, because we have no other way of obtaining same than by taking the figures given us by the Surgeon-General of the Army. *We have authoritative reason to believe that if one had the time and money to spend on going personally to the different army posts and camps and interviewing wholly disinterested parties on the question of typhoid fever among the soldiers, the above figures would be greatly augmented.* The army is naturally interested that health reports should be favorable, since to show a preponderance of disease therein would make recruiting unpopular.

This ridiculous imputation that the statistics published by the War Department are false shows the facile unscrupulousness of the antivivisectionist's mind. As a matter of fact, every case of suspected typhoid in an army post is carefully diagnosed both clinically and by laboratory methods. It follows, therefore, that the diagnoses are made with as much care and accuracy as in any city in the United States. Since reliable statistics are based on careful and accurate observation, there is no reason to question the accuracy of the figures showing the remarkable reduction of typhoid fever in the United States Army since the introduction of antityphoid vaccination.

UNUSUAL COUGH AMONG COTTON CLOTH WEAVERS

Among the various pathologic conditions to which those engaged in the cotton products industry are particularly predisposed is an unusual cough, recently described by Collis,[2] which appeared among weavers, during 1910 and 1911, in a Lancashire cotton mill. In 1911 similar symptoms occurred in a mill at Colne, and, after subsiding, they recurred in 1912. Similar cases were again observed in 1912, 1913 and 1914 in mills at various points in England. In each case those afflicted worked in a dry shed, in which cloth is woven for bleaching, printing and dyeing. Such cloth differs in process of manufacture from other cotton cloth in the small quantity of size applied to the warp threads, and in the omission of antiseptics from the size. These antiseptics are added to prevent the appearance of mildew on the cloth before it reaches the market. The size is composed of various ingredients, of which the most important are flour, tallow, China clay and water. If not thoroughly dried, cotton thread, passed through such a preparation, forms an excellent soil, in the absence of any antiseptic, for the growth of molds. Conditions favorable to the development of mildew apparently existed wherever the illness occurred. Such conditions were the prevalence of exceedingly damp weather and, on other occasions, the necessity for wetting the thread. The symptoms described by Collis are the feeling of constriction of the chest, rapid and rather shallow breathing, and a persistent and rather irritating cough. This cough is accompanied by expectoration of a thick yellow sputum, and a sweetish taste in the mouth. The difficulty in breathing seems to progress until it resembles asthma, and there may be a general malaise. In a few cases herpetic eruptions on the face, smarting and running of the eyes, and loss of the sense of smell have occurred. The condition is an interesting one and certainly worthy of further study.

1. Bradshaw: Open Door, May, 1915, iv, p. 1.
2. Collis, E. L.: The Occurrence of an Unusual Cough Among Weavers of Cotton Cloth, Proc. Roy. Soc. Med., 1915, viii, 108.

THE SIXTY-SEVENTH ANNUAL SESSION

The Sixty-Seventh Annual Session of the American Medical Association will be held at Detroit, June 12 to 16, 1916. The House of Delegates will convene on June 12, and the Scientific Assembly — the Sections — on June 13.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST, SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Sister Superior Dies.—Sister Regina Kenny, for ten years sister superior at the Mobile Hospital, died July 15. Sister Regina had been in executive charge of hospitals for nearly forty years.

Health Surveys.—Surgeon Rudolph H. von Ezdorf, U. S. P. H. S., is conducting a malarial survey at Kaulton and Holt. The blood of each resident of these towns will be examined for the malarial parasite.

Personal.—Dr. Russell M. Cunningham, health officer of Birmingham, has resigned.——Dr. George T. McWhorter, Riverton, suffered a cerebral hemorrhage recently and is reported to be in a critical condition.

Infirmary at Talladega.—Local physicians have combined to incorporate the Talladega Infirmary with a capital stock of $10,000. Dr. Samuel W. Welch has been elected president and Dr. Edward B. Wren, secretary-treasurer, of the corporation.

Madison County to Have Whole-Time Health Officer.—The commissioners of Huntsville and Madison County, at a meeting held July 13, decided to employ a county health officer who will devote his entire time to the work, and who will be paid a salary of from $2,000 to $3,000.

Attempt to Exploit Pellagrins.—The Morgan County Board of Health at New Decatur has sent a vigorous protest to the grand jury against its action in recommending that a number of pellagrins at the county poor farm be turned over to some physician said to be from southern Alabama who wants to treat them for pellagra with a secret remedy. This physician stipulates that the patients shall be allowed to furnish testimonials as to the curative powers of the medicine. The board of health in their protest correctly stated that "scientific articles from our research centers [show] that no "patent" or proprietary medicine now on the market will be of any benefit to a patient suffering from pellagra."

ILLINOIS

Personal.—Dr. Harry A. Pattison has succeeded Dr. Horace B. Dunn, Rockford, as physician of Winnebago County.——Dr. Egbert K. Dimmitt, Farmington, has returned convalescent from the Hospital in Peoria where he was under treatment for five weeks and will spend the balance of the summer at Green Mount Falls, Colo.

Typhoid Traced to Farm Employee.—The twenty-nine cases of typhoid fever in Harvey are said to have been traced to an afflicted employee on the dairy farm of E. N. Wright, near Manteno, from which a large portion of the milk supply in Harvey is received. The employee is said to have gone to Oshkosh, Wis., and the health authorities in that city have been notified and have taken all necessary precautions to prevent the spread of the disease.

INDIANA

Chiropractor Arrested.—William H. Marks, a chiropractor of Rushville, is said to have been arrested on three charges, filed by the Indiana Board of Medical Examiners, of practicing medicine without a license.

New Dispensaries for Children.—The City Board of Health of Indianapolis has announced plans for the opening at an early date of six infant welfare dispensaries at which mothers will receive instructions as to the proper method of caring for their babies and at which pure milk will be distributed by the Children's Aid Association.

Asks Permission to Park Automobiles.—Many physicians of Indianapolis have signed a petition to the city council asking permission to park their automobiles in front of their offices. The petition sets forth that physicians are subject to be called at any moment to serve the general public and that any delay may be fatal to the patient.

Personal.—Dr. Clint C. Sourwine, Brazil, underwent a sixth operation, July 15, on account of an infected wound of the hand.——Dr. Jehu Z. Powell, Logansport, was operated on at St. Vincent's Hospital, July 10, for the removal of gallstones, and is said to be doing well.——Dr. Cassell Tucker, Greencastle, had a very narrow escape from drowning while fording a flooded creek when making a professional call on the Cloverdale Road, July 8.

IOWA

Personal.—Dr. Charles H. Cogswell, Cedar Rapids, has been appointed surgeon of a French war hospital at Neuilly-sur-Seine.——Dr. Fred W. Sallander, Fort Madison, is expecting to go to England to take up special lines of study.

Free Treatment for Children.—A law passed by the last general assembly, which provides for the free medical and surgical treatment and hospital care of poor and unfortunate children at the hospital of the Medical College of the State University, Iowa City, became operative July 4. The law provides that the district court judge may of his own motion or on complaint filed that a child under 16 years of age is suffering from some deformity or malady that may be remedied, or that the parent or guardian are unable to provide means for this treatment, may appoint a physician to examine the child with reference to this malady or deformity. The physician is to make a written report to the court or judge in detail, stating whether or not, in his opinion, such deformity or malady can probably be remedied. On the filing of the report, a day is to be fixed for hearing and the parent or guardian of the child served with notice. If the court or judge finds the child to be suffering from a deformity or malady which can probably be cured, he may enter an order that said child be taken or sent to the University Hospital for free medical or surgical treatment. He may also appoint some person to accompany the child to the hospital, the expenses being paid by the state; the medical staff of the hospital are to prepare all necessary blanks to be used in proceeding under this law and supply them to the clerks of the district courts, and furthermore, no child under the conditions of this law, shall be treated for any ailment except that described by the order of the court, unless permission for such treatment is granted by the parent or guardian, and it is expressly forbidden that any child shall be used for purposes of experimentation.

KANSAS

Baby Clinic.—A free clinic for babies has been established by the Visiting Nurses' Association in Armourdale, with Dr. Gerald L. McGonigle, Kansas City, in charge.

Physician Exonerated.—In a suit for damages for alleged malpractice, brought by T. J. Reed against Dr. John T. Blank, Elk City, the case was dismissed after the plaintiff had introduced his evidence in court.

The Health of Topeka.—Dr. Harold B. Wood arrived in Topeka, July 13, and took over the charge of the food inspection, milk inspection and other bureaus of the health department. Dr. Wood has recently been in charge of the medical inspection of schoolchildren in Chicago.

Personal.—As the result of a mandamus suit, Dr. Chilton W. McLaughlin has been reinstated as health commissioner of Kansas City.——Dr. Walter M. Reitzel, Kanopolis, is reported to be seriously ill with septicemia at Ellsworth Hospital.——Dr. Walter S. Sutton, Kansas City, has returned from war service abroad.

State Board Elections.—Dr. Harry L. Aldrich, Caney, has been elected president of the Kansas State Board of Health, succeeding Dr. James S. Cummings, Bronson, and Dr. Jessie T. Orr, Olathe, was elected vice president.——At the annual meeting of the State Board of Medical Examiners of Kansas, Dr. Arthur J. Anderson, Lawrence, was elected president, and Dr. Henry A. Dykes, Lebanon, secretary (reelected).

MARYLAND

Infantile Paralysis Epidemic.—A series of infantile paralysis cases, amounting almost to the proportions of an epidemic, has been entered at Johns Hopkins Hospital in the last month. Nearly thirty cases have been received. One death occurred three weeks ago. Apparently the disease is confined to eastern and northeastern sections of Baltimore, for an inquiry at all the other hospitals revealed the fact that they have no cases in their charge. The cases at the Johns Hopkins are of children of that section and it is believed that the cases may be traced back to only two, perhaps one source of infection.

Personal.—Dr. Hoagland C. Davis, who has been critically ill at the Union Protestant Infirmary, has recovered sufficiently to be taken home. He will leave later for Blue Ridge Summit for August and September.——Dr. James A. O'Donnell, Baltimore, was thrown from his buggy in a collision with a wagon, July 23, and injured his back.——Dr. J. Thomas Nelson of Baltimore was operated on for appendicitis by Dr. W. A. Fisher, at the Union Protestant Infirmary, and is reported to be much improved.——Dr. Nathan R. Gorter, commissioner of health of Baltimore, has gone to Cape May, N. J., for his vacation and during his absence, Dr. C. Hampson Jones will be the acting commissioner.

Expansion Needs of Johns Hopkins Hospital.—Expansion at the Johns Hopkins Hospital is necessary, according to the latest report of the superintendent, Dr. Winford H. Smith, in spite of the large and elaborate plant of the hospital. Additional ward facilities are needed, especially for white women in need of surgical attention and also for children requiring surgical treatment. Many patients of this class have to be turned away for lack of accommodations. Dr. Smith also urges the establishment of a convalescent home in the country, which will relieve the present congestion of the wards and shorten the period of convalescence. Seven thousand and thirty-three patients were treated during the year compared with 6,818 for last year. More than 25,000 were treated in the dispensary.

MASSACHUSETTS

Tuberculosis Hospital for Malden.—Work will soon begin on the new tuberculosis hospital for Malden on Salem Street, which is to be built at a cost of $30,000 and will accommodate twenty-eight patients.

Personal.—Dr. Francis X. Mahoney has been appointed health commissioner of Boston. The mayor took this action after consultation with Surg. Richard H. Creel, U. S. P. H. S.,

who informed the mayor that it would be impossible for him to accept the position.——Dr. William J. Gallivan has resigned as a member of the Board of Health of Boston and as head of the division of child hygiene.——Richard Norton, Cambridge, founder of the American Volunteer Ambulance Corps, has been awarded the "Croix de Guerre" by the French government for heroic work among the wounded on the battlefield. Dr. Norton formed the ambulance corps, which now consists of about eighty motors, and which has been keeping up a regular line of communication between the front and the hospitals in the rear.——Dr. John J. Dowling has been appointed camp physician of the Harvard Engineering Camp, Squam Lake, N. H.

MINNESOTA

Laboratory to Open.—The Minneapolis laboratory of the State Health Department, which has been closed since May 15, through lack of funds, was opened, August 1, when the next fiscal year's appropriation became available.

Personal.—Dr. Charles S. Sutton has been appointed alternate surgeon for the Great Northern System at St. Cloud.——Dr. D. T. Abernathy, Rochester, who was recently operated on at St. Mary's Hospital, is making satisfactory progress toward recovery.

Minnesota to Furnish War Unit.—The University of Minnesota Medical College has been asked to make up a unit for war service to take its turn at the American Relief Station, Paris. It is expected that the Minnesota contingent will be needed in March or April next.

Approves Action of Sanatorium.—The Upper Mississippi Medical Association, at its meeting held in Akely, July 13, adopted resolutions approving "the present method of the Minnesota State Sanatorium for Consumptives in admitting patients regardless of the stage of the disease."

State Board Items.—At a meeting of the State Board of Health, July 21, Dr. Christopher Graham, Rochester, was elected vice president, and L. P. Wolf, St. Paul, was appointed a member of the executive committee, succeeding Dr. Charles Lyman Greene, St. Paul. The resignation of Dr. Henry M. Bracken, St. Paul, secretary of the board, was not accepted.

Hospital Notes.—The county commissioners of Yellow Medicine County have voted an appropriation of $1,000 to the Canby Hospital. The Canby Hospital board agrees, in consideration of this appropriation, to accept and care for four patients from the county.——Ground was turned, July 10, for the new Franciscan Hospital, Little Falls. The new building will cost about $65,000, will be three stories and basement in height and fireproof and brick structure.——Dr. Thorvald Petersen, Gaylord, proprietor of the Gaylord Hospital, has disposed of his interest in the institution to Dr. William Black, Tyndall, S. D.——The new St. John's Hospital, St. Paul, erected at a cost of $125,000, will be ready for occupancy by the middle of September.

Sanatorium Notes.—Contracts have been let for the construction of the Tri-County (Beltrami, Koochiching and Hubbard) Tuberculosis Sanatorium, to be built under the state aid plan. A main building will be erected at a cost of $29,615. The sanatorium will provide for thirty patients. ——Up to the present time, thirty-one counties of Minnesota have taken advantage of the county tuberculosis sanatorium law passed by the legislature of 1913.——The Joint Tuberculosis Sanatorium Commission for Crow Wing and Aitkin counties met at Brainerd, July 13, and organized by electing Dr. John A. Thabes, Brainerd, president, and Peter Larsen, secretary; and authorized these officers to advertise for offers of 40 or 80 acres of land as a site for the sanatorium which is to be located between Cedar Lake and Deerwood, not more than 2 miles from the Northern Pacific Railroad. ——It is reported that the Goodhue County Sanatorium will be ready for occupancy in September.——Todd and Wadena counties have decided to combine in the erection of a tuberculosis sanatorium to cost $25,000.

MISSOURI

Personal.—Dr. William C. Bradley, St. Louis, has been appointed assistant surgeon to the United Railways Company.——Dr. Richard H. McBaine, St. Louis, is seriously ill with septicemia in Barnes Hospital.

Leper in Kansas City.—Pedro Petrisia, a Mexican, was taken to the old City Hospital, Kansas City, July 20, suffering from leprosy. He has been placed in a vacant isolation ward until his deportation can be arranged.

Last Honors to Dr. Dorsett.—At the funeral of Dr. Walter B. Dorsett, July 29, Drs. Jacob Friedman, Francis K. Fry, Paul Y. Tupper, Frank A. Glasgow, W. A. McCandless and Arthur F. Kleykamp were active pallbearers, and former presidents of the St. Louis Medical Society, Missouri State Medical Association and members of the faculty of St. Louis University, were appointed honorary pallbearers. The members of the St. Louis Medical Society attended the funeral in a body.

NEBRASKA

New Building for Hospital.—Plans are being prepared for the proposed second building of St. Katherins Hospital, Omaha, at Ninth and Forest Avenues. It is said that a building to cost $40,000 will be erected this year.

Reorganization of Omaha Medical Staff.—The Union Pacific System has reorganized its medical staff. Dr. August F. Jonas, Omaha, continues as chief surgeon, with the following assistants: hospital surgeon, Dr. Elmer J. Updegraff; local surgeons, Drs. Seymour H. Smith, Robert R. Hollister and Oscar S. Hoffman; surgeons at the shops, Drs. George R. Gilbert and James S. Loney; and oculists and aurists, Drs. Frank S. Owen and William P. Wherry.

Personal.—Dr. E. E. Vander Slice, superintendent of the State Sanatorium, Kearney, has been elected a director of the National Association for the Study and Prevention of Tuberculosis.——Dr. Oscar S. Gray, Ayr, was operated on at the Nebraska Sanatorium, Hastings, on account of a disease of the hip, July 22.——Dr. Fred E. Calkins has succeeded Dr. Anders P. Overgaard as local surgeon for the Union Pacific System at Fremont.——Dr. Chauncey F. Chapman has succeeded Dr. John F. Spealman as health officer of Lincoln.——Dr. Frank A. Packard, Kearney, has been reelected grand medical examiner of the Nebraska Ancient Order of United Workmen.

NEW JERSEY

Campaign for Hospital.—In an effort to raise $100,000 for the erection of a new building for All Souls Hospital, Morristown, the directors have decided to hold a public campaign from October 13 to October 30.

Antituberculosis Association Incorporated.—The Somerset Antituberculosis Association has filed articles of incorporation, and the trustees include Drs. Mary E. Gaston, Lancelot Ely and Aaron L. Stillwell, all of Somerville.

Personal.—Dr. Jacob Cole Price, Branchville, formerly state senator, has been appointed director of the State Department of Health.——Dr. George E. Harhen, Verona, has been appointed chief resident physician of the Verona Sanatorium.——Dr. Samuel Freeman, Trenton, who has been ill since January, has gone to White Haven, where he will spend about three months taking a rest cure.

Sanitation for Pennsgrove.—On July 20, a conference was held at Trenton, between the State Board of Health and officers of the Pennsgrove Borough, Upper Pennsneck Township, and representatives of the DuPont Powder Company. An arrangement was made whereby the officers of Pennsgrove Borough were ordered to draft an ordinance to clean up the town. Under the terms of the ordinance, the Pennsgrove Borough government is to name A. M. Greer, new chief engineer of the sanitation for the powder company, and his assistant, Paul Scott, and these two officers are to lay out a complete system of night soil and garbage collection, the charges for doing so to be borne by the house renters. To start the work and see that proper sanitation inspection is maintained, the DuPont officials offered $1,000 and the town is to appropriate a similar sum.

Bamberger Seashore Home Opened.—Five years after the death of its founder, the Max and Sarah Bamberger Seashore Home for Invalid Jewish Children, was officially opened on August 1. The home was actually opened on July 1 and has about 100 patients at the present time. The purpose of the philanthropy is to give invalid Jewish girls under 15 years and boys under 12 years a seashore home. In the founder's will was the following clause: "It is my desire that the sum of $400,000 be used to erect and maintain at Atlantic City, N. J., or at some point in the vicinity thereof, a home similar to the Children's Seashore Home, for the accommodation and medical treatment of invalid Jewish women and children, to be known as the Max and Sarah Bamberger Home." The home is built of brick and concrete, fitted

throughout with every convenience. The administration building and dormitories are connected by wide porches in such a way that additional wings can be added. The home is fitted with lockers, showers, laundry, operating room, dispensary and reception rooms, beside the accommodation provided for the staff and patients.

NEW MEXICO

Personal.—Dr. Le Roy S. Peters of the staff of the Albuquerque Sanatorium for Tuberculosis, has been elected a director of the National Association for the Study and Prevention of Tuberculosis.——Dr. Ernest A. Duncan, Silver City, has been elected medical director of the new National Methodist Sanatorium, Silver City, and Dr. M. O. Stockland has been made resident manager of the institution.

NEW YORK

Personal.—Pliny T. Sexton of Palmyra has been elected chancellor of the University of New York by the State Board of Regents, to succeed the late St. Clair McKelway, and Dr. Albert Vander Veer of Albany has been elected vice chancellor.——Dr. Lyman G. Barton, Jr., Willsboro, has returned from the war zone and resumed practice.

Four-County Medical Society Launched.—The first meeting of the Four-County Medical Society was held at Letchworth Park, July 22, with an attendance of 244. Addresses were made by Dr. L. Faugeres Bishop of New York City on "Cardiovascular-Renal Disease," and by Dr. William Seaman Bainbridge, New York City, on "Intestinal Stasis." The establishment of the society on a permanent basis was approved, and Dr. William R. Thomson, Warsaw, was elected president and Dr. George K. Collier Sonyea, secretary, pending the formal organization of the association.

New York City

New Hospital Opened.—The St. Lawrence Hospital, on One Hundred and Sixty-Third Street, near Edgecombe Avenue, was opened, July 24, for city cases. When completed, the plant will have cost $1,000,000. It covers the territory of the Washington Heights Hospital from One Hundred and Forty-Fifth to One Hundred and Sixty-Fourth Streets and from the Hudson to the Harlem rivers. The hospital is administered by the sisters of the community of Mount St. Vincent.

Prosecute Ice-Cream Cone Makers.—The Bureau of Food Hygiene of the Department of Health has ordered the criminal prosecution of four manufacturers of ice-cream cones. This move is the result of an investigation during which twenty-one violators of the sanitary law were discovered. Twelve of these decided to comply with the laws, five chose to retire from business and four refused either to retire from business or to make the required changes. It is stated that the activity of the department will be extended to the sellers of the cones.

Health Department Temperance Crusade.—The most recent move of the Health Department in its campaign against alcoholic beverages was the publication on July 31 of the results obtained from a study of the effects of alcohol on human life. Forty-three leading life insurance companies have furnished their records on about 2,000,000 lives covering twenty-five years. The report in summarizing states that nothing has been more conclusively proved than that the steady free use of alcoholic beverages or occasional excess is detrimental to the individual. Among men who admitted that they had taken alcohol occasionally to excess in the past, but whose habits were considered satisfactory when they were insured, the extra mortality was equivalent to a reduction of more than four years in the average life of these men. The report further states that statistics have been gathered that justify the statement that total abstainers have a mortality during the working years of life of about one half of that among those who take two glasses of whisky a day.

Health Department and Child Labor.—According to law no child under the age of 16 years may be employed in any factory or mercantile establishment without having first secured a permit issued by the Department of Health. In order to obtain such a permit the child is required to present a certificate stating that he has reached at least Grade 7a in school. In addition to this, the child must pass a physical examination conducted by the Department of Health. During the quarter ended June 30, 1915, 10,606 permits were issued and 438 children were refused. The total number of physical examinations made was 11,468. In the course of these examinations the following defects were found: defective vision, 1,128; defective hearing, 142; defective nasal breathing, 291; hypertrophied tonsils, 908; defective nutrition, 277; cardiac disease, 129; pulmonary disease, 23; orthopedic defects, 73; nervous diseases, 37; defective teeth, 3,760; goiter, 75; skin diseases, 26; hernia, 14; enlarged glands in neck, 2,230; acute eye diseases, 192; pediculosis capitis, 39, and defective palate, 16.

NORTH CAROLINA

Sanitary Expert for High Point.—It is announced that a sanitary expert of the United States Public Health Service will be sent to High Point early this month to assist the state and municipal authorities in the crusade for municipal sanitation.

Hospital Soon to Be Commenced.—The executors of the will of the late Caesar Cone, Greensboro, announce that in the near future they will begin the construction of the Caesar Cone Memorial Hospital, Greensboro, and the Recuperation Hospital at Blowing Rock, for which a provision of $2,000,000 was made in the will of Mr. Cone.

Personal.—Dr. John M. Newbern, Jarvisburg, superintendent of schools at Currituck County for the last eight years, has retired.——Dr. William H. Kibler, Rocky Mount, whole-time health officer of Nash County, has resigned, to accept a position in South America with the Rockefeller Commission in the work against hookworm.

Registry for Tuberculosis Nurses.—The North Carolina State Sanatorium for Tuberculosis, which recently established a training school for nurses, has inaugurated a registry for those nurses in the state who have had special experience in tuberculosis work and desire to be so registered. Full information regarding this registry will be furnished by the superintendent of the sanatorium.

OHIO

Hospitals Near Completion.—The new buildings of St. John's and the surgical wing of Charity hospitals, Cleveland, are nearing completion and are soon to be ready for occupation.

Bi-County Tuberculosis Hospital.—The county commissioners have adopted resolutions providing for a bond issue of $50,000 for the purchase of a site for a new bi-county tuberculosis hospital for the joint use of Preble and Montgomery counties.

New Alumni Officers.—The following officers of the Alumni Association of the Western Reserve Medical School have been elected: president, Dr. Frederick C. Herrick, Cleveland; vice presidents, Drs. Hiram B. Ormsby, Cleveland, and Lewis A. Buchman, Canton; recording secretary, Dr. Joseph C. Placak, Cleveland; corresponding secretary, Dr. John C. Fox, Cleveland; and treasurer, Dr. Ellis B. Rhodes, East Cleveland.

Faculty Appointments.—The following new appointments have been made at the Medical School of Western Reserve University, Cleveland: Dr. William Evans Bruner, clinical professor of ophthalmology, to be professor of ophthalmology, with seat and vote in the faculty.——H. H. McGregor, A.M., Ph.D., to be instructor in biochemistry.——Dr. Chester D. Christie, demonstrator of medicine and medical resident of Western Reserve University and Lakeside Hospital, to be director of the clinical research laboratory at Lakeside Hospital.——Dr. Russell J. Collins to be demonstrator of pharmacology.——Mr. H. A. Hitchcock, A.M., formerly trustee of the University and Adelbert College, has been appointed registrar of the medical school.

Personal.—Dr. Joseph W. Kirgan, Cincinnati, has been appointed a member of the State Board of Agriculture.——Dr. Walter G. Stern, Cleveland, has been appointed consulting orthopedic surgeon to the recently opened Gates Hospital for Crippled and Deformed Children, Elyria.——Dr. Philip D. Wilson, Columbus, has returned after three months on the staff of the Harvard unit in Paris.——Dr. George D. Nicholas, Elyria, is reported to be seriously ill in the Memorial Hospital, Elyria, with septicemia, due to an operation wound.——Dr. Wilhelm H. Vorbau of the Athens State Hospital has been transferred to a similar position in the new Lima State Hospital.——Dr. Albert H. Herr, Lima, is reported to be seriously ill in the Lima City Hospital.——Dr. James G. Blower, Glouster, has been elected a trustee of the People's Hospital, Akron, suc-

ceeding Dr. Mark D. Stevenson, deceased.——Dr. William M. Goff, Marysville, sustained a slight cerebral hemorrhage, July 8.——Dr. Alfred Irving Ludlow, formerly associate in surgery in Western Reserve University, Cleveland, now professor of surgery and surgical pathology in the Severance Union Medical College, Seoul, Korea, has been granted a leave of absence and is now sojourning in Cleveland.——Dr. Rolla E. Hoffman, demonstrator of pathology, Western Reserve University, and resident pathologist in Lakeside Hospital, has started for Persia as a medical missionary.

PENNSYLVANIA

Ambulance for Doylestown.—In memory of Dr. O. P. James, one of the most prominent physicians of Bucks County, his daughters, Mrs. George H. Lorah, Philadelphia, and Miss Sarah H. James, have presented Doylestown with an automobile ambulance.

Memorial Laboratory.—The children of William H. Singer, Pittsburgh, will erect a laboratory for investigations into the origin of disease, which will be operated in connection with the Allegheny General Hospital. The cost of construction, equipment and endowment will amount to $400,000.

Personal.—Dr. Guy C. Milnor, Williamsport, for the past year an intern in the Queen's Hospital, Honolulu, is now physician on a sugar plantation of 20,000 acres at Puunene, Maui, T. H., with 7,000 people to look after. There is a well-equipped hospital with eighty beds and three dispensaries, with 200 patients a week. In addition there are twenty-one camps to be inspected. The position pays a comfortable salary, with expenses, and is an example of the opportunities open to young medical graduates in the possessions of the United States.——Dr. Raymond J. Cary, Pittsburgh, has accepted the position as superintendent of Mountain View, the Pierce County, Wash., Tuberculosis Sanatorium.——Dr. Edward W. Ryan, Scranton, chief of the American Red Cross in Belgrade, has been decorated by both the Serbian and French governments for his work in the hospitals where typhus fever has been raging. France has made him chevalier of the Legion of Honor, the official order of the French Republic.

Philadelphia

Supposed Typhus Cases Prove Typhoid.—The two supposed cases of typhus fever taken from the Danish steamship *London*, which arrived in Philadelphia July 28, and held in quarantine, proved to be ordinary typhoid by laboratory tests.

Alleged Swindlers of Physicians.—Physicians from all sections of Philadelphia were in attendance at the Germantown Police Station July 24, to attend the hearing of Robert Colliday and Robert Wilkinson, charged with obtaining money under false pretenses by the sale of books to physicians. Eleven physicians appeared against the accused men and testified that books ordered and paid for had never been delivered. The accused were each held under $300 bail for further hearing.

Personal.—Dr. E. E. Montgomery has entirely recovered from his operation for hernia.——Dr. James K. Young has resigned the clinical professorship of orthopedic surgery at the Woman's Medical College.——Dr. William H. E. Wehner has been appointed medical director of the Fidelity Mutual Life Insurance Company in place of Dr. William H. King, resigned.——Dr. Benjamin De Vecchis has been recalled by the Italian government for war service and sails from New York, August 14.——Dr. Carlton N. Russell sailed from New York, July 24, on the steamer *La Touraine*, to join the Philadelphia contingent.——Drs. Ignazio Cortese, Ottavio Monticelli, and Vincent de Virgiliis, reservists of the Italian army, sail for Europe this month.

Postgraduate Teaching Association Organized.—The Cooperative Association for Postgraduate Teaching of Medicine in Philadelphia has recently been organized by more than one hundred practitioners of Philadelphia with Dr. David Riesman as chairman and Dr. George P. Muller as temporary secretary. The objects of the association are stated to be to investigate and ascertain the resources for postgraduate teaching that exist in Philadelphia; so to arrange the courses offered by each hospital and college as to enable the students to spend each day in solid study or laboratory work, and the establishment of a central office in charge of the permanent secretary, where rosters of courses may be made and where all information will be listed.

WASHINGTON

Inspection in Seattle.—During the last year, 75,839 Seattle schoolchildren were examined; nurses visited 5,984 homes, and 3,803 children were treated for minor injuries, according to a report made by Dr. Ira C. Brown, medical director of the Seattle school district. Dr. Brown recommends the appointment of three additional nurses.

State Society Meeting.—At the annual meeting of the Washington State Medical Association held in Tacoma, July 21 to 23, the following officers were elected: president, Dr. John R. Brown, Tacoma; president-elect, Dr. John M. Semple, Spokane; vice presidents, Drs. Arthur E. Burns, Seattle, and C. Stuart Wilson, Tacoma; secretary-treasurer, Dr. Curtis H. Thomson, Seattle; assistant secretary, Dr. John H. O'Shea, Spokane; delegate to the American Medical Association, Dr. Don H. Palmer, Seattle; and alternate, Dr. Charles F. Eigenbary, Spokane. Seattle was selected as the place of meeting for 1916. The office of assistant secretary was created in order to give official representation to Eastern Washington.

WISCONSIN

Chiropractic Bill Lost.—It is reported that the senate committee turned down the bill which proposed to license chiropractors. The committee declared, after a careful consideration, that in their belief this new school of practice was not entitled to recognition under the laws of the state.

Dispensary for Milwaukee.—Following out the provisions of the late Mrs. Keenan, who left $300,000 to establish and maintain a free medical dispensary in Milwaukee, a meeting is soon to be held between the trustees of the fund and the City Health Department to work out the arrangements as contemplated in the will.

Health Service in the State.—A campaign for the establishment throughout the state of a generalized nursing service, each unit of which should cover a special district, has been commenced by the Wisconsin Association of Graduate Nurses. An experimental health unit is being established in order to test the practicability of the generalized nursing service idea.

Personal.—Dr. Reuben J. Elliott, National Home, has been appointed first assistant surgeon at the Soldiers' Home, Milwaukee, succeeding Dr. Edward B. Frisbee, resigned.——Dr. Joseph D. Sullivan, Menasha, suffered a severe laceration of the hand while attempting to crank his automobile, July 14.——Dr. Joseph P. Donovan, health officer of Madison, suffered a severe sprain of his shoulder by the overturning of his automobile near La Valle, July 11.——Dr. Henry J. Connor, Superior, is reported to be seriously ill at his home.

Law Fixes Higher Standard.—A new medical practice act recently secured fixes the minimum standard of preliminary education for all applicants after Jan. 1, 1919, to two years of collegiate work, the equivalent of a two years' premedical course at the University of Wisconsin. It is specified that the work shall include college courses in physics, chemistry, biology and either French or German. This is the tenth state to adopt this higher requirement, the other nine being Alabama, Colorado, Indiana, Iowa, Minnesota, New Hampshire, New Jersey, North Dakota and South Dakota.

Hospital News.—A new $35,000 hospital was opened in Sparta last month by the Franciscan Sisters, to take the place of a smaller hospital now discontinued. The new hospital is a brick and stone structure, three stories and basement in height and with modern equipment.——A meeting was held in Stanley to discuss the question of bonding the city to provide for the construction and equipment of a municipal hospital.——Plans are under way for the enlargement and development of St. Agnes' Hospital, Fond du Lac. The plans proposed include hospital standardization, staff organization, establishment of pathologic, bacteriologic and Roentgen-ray laboratories, the inauguration of an outpatient department, the making of necropsies, the starting of a medical library, the establishment of a school for nurses and a nurses' home and the employment of an intern.

CANADA

Queen's Hospital for the Dardanelles.—Dean Connell of Queen's Medical College, Kingston, Ont., received a cable from the war office, July 27, that they desired to send the Queen's stationary hospital to the Dardanelles. All preparations had been made for the hospital corps to go to France,

but it has given such excellent satisfaction at Folkstone and its organization has been so well perfected that the war office wishes to make special use of it in a place where the work is anything but easy.

The Insane in Ontario.—The population of the province of Ontario was set at the last census in 1911 at 2,500,000. At the close of 1914 there were 6,000 residents in the hospitals for the insane throughout the province—about one in 420 of the population. There were admitted in the last hospital year, 1,337 new cases. The physicians of Ontario thus had to pass on that number of insane and possibly as many more suffering from mental disease who could be kept at home. Four of the hospitals in 1913 discharged 40 per cent. of their daily average population.

Feebleminded in Ontario.—The institution for the feebleminded for Ontario is at Orilla, on the shore of Lake Simcoe. The normal capacity of that institution is 740 patients. In 1912 the daily average population was 814; for 1913, 815; 1914, 815. The discharges in 1913 numbered just three. The vacancies depend largely on the number of deaths. The accommodation of the institution is overtaxed. There are, however, two cottages in course of erection which when completed will provide accommodation for an additional 300 inmates. The institution is a training school and custodial institution for children who are not normal and never will be normal.

Winnipeg Municipal Hospitals.—In the annual reports of the municipal hospitals of Winnipeg, Man., the expenditure for the year is set down at $133,910.80. The number of patients admitted during the past hospital year was 1,104 and 109 were carried over from the previous year. The net cost was $2.31 per patient per day. The King George has accommodation for 190 patients but has never had more than 140 in any single day, and the average for the entire year was only seventy-eight. After four years' experience with the commission form of government to keep the hospitals free from municipal or political influence, the plan has proved satisfactory.

Third Annual Announcement—Medical Council of Canada.—The report records the transactions of the Dominion Medical Council for 1914 and announces the examinations for 1915 to be held in Montreal and Halifax on October 12. The June examinations were held in Toronto and Winnipeg. The report of the registrar, Dr. Robert W. Powell, Ottawa, gives the receipts at $36,871.62, and the expenditure is put down at $23,295.17. In 1914, 86 candidates wrote on the examinations, of whom 49 were successful, 22 rejected and 15 referred in one or two subjects. As showing the residence of the 86 candidates; 39 were from Ontario; 22 from Quebec; 4 from Saskatchewan; 2, Alberta; 3, Nova Scotia; 6, New Brunswick; 4, British Columbia; 5, United States; 1, West Indies. As showing the source of the candidates' degrees: 44 were from McGill; 19 from Queen's; 8 from Western (London); 7 from Toronto; 6 from Laval; 1 from Chicago; 1 from a Philadelphia college.

Personal.—Lieut.-Col. Herbert A. Bruce, Toronto, has gone to England.——Lieut.-Col. Robert D. Rudolph, Toronto, who was home on sick leave, has fully recuperated and returned to his command of No. 2 Canadian Hospital at Boulogne.——Dr. Rowland W. Young, Oshawa, Ont., sailed on the *Corsican* for England to offer his services to the R. A. M. C.——Dr. R. E. McConnell, Montreal, when the War broke out, a year ago, was engaged in medical work for the British government in Uganda, British East Africa. He was appointed to command the commissariat with the rank of captain. Subsequently he was appointed officer in command of the medical western section; in charge of the field ambulance detachment, clearing hospital and all medical matters in western section of British East Africa, the appointment ranking him second in command of the Uganda staff. He expected to return to Montreal the present summer but will not return until after the war.——Dr. Howard D. Harrison, F.R.C.S., Milton, Ont., who was taking a postgraduate course in England when war was declared, has been promoted to the rank of major in the R. A. M. C. Dr. Harrison is chief surgeon in the Welsh Metropolitan War Hospital in London, a hospital of 900 beds.——Major E. B. Hardy, Toronto, is in charge of No. 2 Field Hospital in Belgium. He writes that the hospital is doing splendid work for the wounded Canadians and British.——Capt. Duncan Graham, who went abroad with the University of Toronto base hospital, is doing special duty at the Duchess of Connaught Hospital at Cliveden. Major John A. Amyot, with the same unit, is sanitary officer at the camp. Major C. S. MacVicar is registrar.——Dr. George S. Strathy, Toronto, is at Moore Barracks, Shorncliffe.

GENERAL

Missouri Valley Physicians to Meet.—The twenty-eighth annual meeting of the Medical Society of the Missouri Valley will be held in Des Moines, Iowa, September 23 and 24, under the presidency of Dr. Granville N. Ryan, Des Moines.

New Medical Fellowship.—A fund donated by Mr. Douglas Flattery of Boston, which will bear an annual income of about $800 has been presented to Harvard Medical School for the encouragement of the scientific study of the cause, cure and prevention of disease.

The China Medical Board.—Dr. Wallace Butterick, who is to direct the work; Dr. William H. Welch, Baltimore, and Dr. Simon Flexner, New York City, director of the laboratories of the Rockefeller Institute, sail for China this month to establish the work of the China Medical Board, and take over the Union Medical College, Peking, which has been purchased with funds furnished by the Rockefeller Foundation. The Rockefeller Foundation has also appropriated $16,000 each for five years to the Yale Medical College in China and the Harvard Medical College in China. All of the modern equipment of laboratories and clinics will be introduced and the resident director will be Roger S. Green, former American Consul General at Hancow.

Bequests and Donations.—The following bequests and donations have recently been announced:

Women's Medical College of Philadelphia, Pa., $5,000, by the will of Mrs. Anna Yarnall, Philadelphia.

Sanatorium Association of Philadelphia, $5,000; St. Mary's Hospital, New York City, $10,000; Children's Seashore Home, Atlantic City, and Women's Seashore Home, each $3,000, by the will of Mrs. Sarah E. Farnum Batterson, of Philadelphia.

Home for Incurables, Philadelphia, one third of the estate of $2,500, left by Sarah E. Williamson.

For the purpose of establishing, carrying on, providing and maintaining one or more free dispensaries in the city of Milwaukee, where medicines, medical supplies, medical advice and relief shall be furnished free of charge, to such indigent or sick persons residing in the city of Milwaukee as the trustees shall select, $300,000, by the will of Mrs. Antoinette E. Keenan.

American Red Cross, $1,000, receipts of the pageant at Lexington, Mass.

Harrisburg Hospital, a donation of $6,000 from Mrs. Lyman D. Gilbert, the income of which is to be devoted to the maintenance of a free bed to be known as the Henry and Harriet Gilbert Memorial.

University of Pennsylvania, $50,000, the income of which is to be used for the maintenance of the William Pepper Clinical Laboratories of Medicine, by the will of Samuel Dickson.

German Hospital, Philadelphia, $4,300 by the will of the late Elizabeth M. D. Prince, as a memorial to her father, Henry W. Internach.

Prizes to Red Cross.—A grand prize has been awarded the American Red Cross by the supreme court of the Panama Pacific Exposition for a collective exhibit of activities in life saving, nursing and hygiene. A second grand prize was for a combined exhibit of medical and surgical instruments, materials, etc.; a gold medal was awarded for "Protection Against Floods," and a silver medal for "First Aid Equipment." In addition to the foregoing, the jury awarded a silver medal to each of the following collaborators in the Red Cross service: Mr. Ernest P. Bicknell, national director; Mr. Lewis E. Stein, who was responsible for much of the constructive work in connection with the installation of the Red Cross exhibit; Maj. Robert U. Patterson, M. C., U. S. Army, chief of the Medical Bureau; Miss Jane A. Delano, chairman of the General Nursing Service; Miss Fannie F. Clement, superintendent of the Town and Country Nursing Service; Mr. Charles D. Jameson, the American civil engineer who made the pioneer flood prevention study in the Huai River district of China for the American Red Cross, and Lieut.-Col. William L. Sibert, Engineer Corps, U. S. Army, who served as chairman of the American Red Cross-Chinese Conservancy Board, and directed the final investigation which resulted in the formulation of a definite plan of flood prevention work in the Huai River region.

Arrest of Promoter of Index Association.—In THE JOURNAL last week announcement was made of the arrest, in Detroit, of one C. A. Beck, who was connected with the so-called American Medical Index Association. Some time ago THE JOURNAL announced that Beck had operated in New Orleans and had duped a number of physicians. Dr. Rudolph Matas was one of the physicians of New Orleans who suffered financial loss through the activities of this particular individual. Dr. Matas says that on receipt of information that Beck was in Detroit, "I at once submitted the whole matter to the U. S. district attorney. He had already accumulated sufficient evidence against Beck to have him arrested on the charge of using the mails for fraudulent purposes.

. . . It would be well that a notice of this man's arrest be published as early as possible, and that as much publicity be given to the notice in order that his numerous victims may have an opportunity to assist the government officials in obtaining his conviction and punishment. I have recently received communications from prominent physicians in Pittsburgh, Fort Wayne and Vincennes, Ind., and lately from Michigan, which show that Beck's depredations have covered a wide range of territory since March 20, when you first warned the profession of this man's nefarious practices in THE JOURNAL. Before that time he had already traveled in Louisiana, Texas, Kentucky, Ohio and Pennsylvania. While sufficient testimony to convict Beck a dozen times is already in our hands, it is desirable that the hands of justice be strengthened by the testimony of the numerous physicians who have suffered through his rascally schemes."

FOREIGN

Body of Hildebrandt Recovered.—In 1912 Professor Hildebrandt, instructor in pharmacology at the University of Halle, lost his life while on a mountain-climbing trip. His body was recently found in a crevice by soldiers crossing the Bozen district.

Deaths in the Profession Abroad.—E. Rhode, instructor in the physiology and pharmacology of the heart at the University of Heidelberg succumbed to pneumonia contracted in the Red Cross service, aged 34.——A. Schliz of Heilbronn, noted for his studies in prehistoric anthropology for which he was awarded the Wurttemberg "gold medal for art and science" a few years ago.——T. C. Egeberg of Christiania, family physician to the king of Norway, a leading surgeon, aged 68.

Conditions in Mexico.—Reports to the American Red Cross of date of July 31 state that in and around Hermosillo, Sonora, Mexico, conditions are getting worse every day and that the government is taking all the wheat from farmers and all flour. Many families have had only one meal a day and that a very poor one.——It is also reported that chaos exists in Mexico City and that the condition of the people there is desperate and the people are actually dying from starvation.——The American Red Cross has ample funds, but is unable to purchase food and the condition of the people has been rendered almost hopeless, owing to the frequent changes in revolutionary control.

WAR NOTES

German Island Health Resorts Closed.—The authorities have ordered all visitors away from the German health resorts on six islands in the North Sea, in the interests of public safety, while the war lasts.

Honor Memory of Typhus Hero.—A monumental cross bearing the inscription "James F. Donnelly, Staff Physician, New York City, U. S. A.," has been erected over the grave of Dr. Donnelly who died while working to conquer the scourge of typhus fever in Serbia.

Second Harvard Unit at Work.—The second Harvard unit, which sailed for England the last week in June, is thoroughly organized and is in charge of a thousand-bed hospital. Dr. Edward H. Nichols will be relieved as surgeon in charge by Dr. Franklin G. Balch, Boston, who sailed from New York, July 31. With Dr. Balch sailed Drs. Edward P. Richardson, Channing C. Simmons and Donald B. Steenberg.

Deaths in the Profession on the Firing Line.—Our Italian exchanges have now joined the sad procession of medical journals that have to devote a few lines each week to a list of members of the profession, including medical students, who have fallen "on the field of glory" or been wounded or captured. The French and British also give a list occasionally of the sons of well-known physicians, not physicians themselves, who have fallen or been captured.

Red Cross Must Recall Physicians and Nurses.—On account of lack of funds it is announced that the American Red Cross will be obliged to withdraw its various physicians and nurses from European battlefields on October 1, as the general fund which aggregates $1,565,000 will at that time have been exhausted.——The Red Cross has sent to the war zone, 367 persons engaged in humanitarian enterprise. Of that number, 71 were surgeons and 253 nurses, while 43 were members of the Serbian sanitary commission.

Aid for Blinded Soldiers.—Professor v. Grosz of Budapest has offered a prize of 200 kronen, about $50, for the best work received before August 15 on the subject of the best measures that can be applied to ameliorate the condition of the men blinded in the war. The Hungarian army has between seventy and eighty soldiers who have been thus blinded. The Vienna daily, the *Neue Freie Presse*, has collected a fund for Austrian blinded soldiers which had reached 400,000 kronen early in July.

First Harvard Unit Returns.—Drs. Robert B. Greenough, Robert B. Osgood, Orville F. Rogers, Jr., and Lyman G. Barton, Jr., of Harvard Medical School; Drs. Elliott C. Cutler and M. N. Smith-Peterson of the house staff of the Peter Bent Brigham Hospital, and two nurses have returned from Paris and reached New York, July 13.——Drs. Beth Vincent and Philip D. Wilson of the Massachusetts General Hospital are returning by way of England.——Dr. Frederick A. Coller of the Massachusetts General Hospital has joined the English unit for service and Dr. George Benet has taken service in the Anglo-French Red Cross front line hospital north of Compiegne.

Aid for Belgian Physicians.—The report of the treasurer of the committee of American physicians for the aid of the Belgian profession, for the week ended July 31, 1915, lists the following contributions:

Washington County (Ark.) Med. Society, Fayetteville, Ark.		$ 14.00
Dr. J. F. Pressley, San Francisco, Calif.		5.00
Receipt for the week ending July 31		$ 19.00
Previously reported receipts		7,750.84
Total receipts		$7,769.84
Previously reported disbursements:		
1,625 standard boxes of food at $2.20	$3,575.00	
1,274 standard boxes of food at 2.30	2,930.20	
353 standard boxes of food at 2.28	804.84	
Total disbursements		7,310.04
Balance		$ 459.80

F. F. SIMPSON, M.D., Treasurer,
5 Jenkins Arcade Bldg., Pittsburgh.

LONDON LETTER

LONDON, July 15, 1915.

The War

GREAT IMPROVEMENT IN THE HYGIENIC CONDITION OF SERBIA

British and other foreign physicians have done a great work in Serbia. At the outbreak of the war there were fewer than 400 Serbian doctors, and the mortality among them has been so great that there are now believed to be only 230. Nothing could exceed their devotion, but there were not enough for the army alone, so that the civil population was practically left without advice. Trained nurses do not exist in the country. When the epidemics of typhus and typhoid broke out, no attempt could be made to stop them. It is believed that the deaths from typhus alone amounted to over 200,000. When the foreign physicians arrived, the conditions were appalling. Six British physicians without nurses, water or appliances struggled to look after 2,000 wounded and sick scattered through three buildings, from which the new patients taken in each night numbered as many as the dead which were carried out in the morning. Soldiers lay two or three in a bed or packed on the floors, and patients with wounds, frost-bite, smallpox, diphtheria, typhus and typhoid were crowded together. Foreign physicians and nurses poured into the country and effected a transformation. There are now 420 British physicians and nurses in Serbia, and their complaint is lack of work. For about five months there have been no new wounded, and typhoid and typhus have declined till they are no longer a menace. However, fighting may start at any moment and give the hospitals as much as they can do. The work done by other nations than the British is also worthy of praise. Americans have been arriving in such numbers that their work already challenges comparison with the British and may become even greater. An international sanitary commission has been established at Nish, and has apportioned the work to the different nations. France has charge of the northern half of the country, and the United States of the southern. Nish and its immediate neighborhood are under the Russians. The British have had the care of the army and most of the hospital work. The work done by the Americans under Dr. Strong continually increases. He has behind him the great financial resources of the Rockefeller Foundation, and the United States is the only country which can spare a limitless supply of physicians. Twenty-five more American physi-

cians are expected soon, and they are only the advance guard of a contingent of 150.

Congenital Syphilis Among the New-Born

The government has recently instituted an inquiry into the prevalence of congenital syphilis among the new-born in the East End of London which has been conducted by Dr. Paul Fildes, assistant bacteriologist to the London Hospital. His report shows that the incidence of the disease is not so great as has been supposed. The Wassermann test was performed on 1,015 infants in the service of the maternity department of the hospital. Only fourteen gave positive reactions. Only one of the children showed manifest symptoms of syphilis at the time of birth. Six hundred and sixty of the infants came up for a second examination between the second and fourth months, and of these only three gave a positive reaction, and only one showed symptoms of the disease. All the mothers of syphilitic infants showed a positive reaction, but only four out of twenty-seven syphilitic women had syphilitic children. Of the thirty-one healthy infants with positive reaction at birth, seven were subsequently brought up between the second and fourth month for further examination. They were still found to be healthy, and gave negative Wassermann reactions. On the other hand, all the mothers of these infants gave positive reactions. It thus appears that a positive reaction at birth does not necessarily imply the presence of syphilis in the infant, but may simply indicate the passage of substances from the maternal blood to the circulation of the child which are capable of producing a positive reaction.

Notification of Births Bill

The second reading of the notification of births bill has been carried in the House of Commons. In moving it, Mr. Long, president of the Local Government Board, said that he proposes to extend the powers of the notification of births act and make it universal throughout the country. It proposes also to deal with the health of expectant mothers and of the young children themselves. Experience shows that where notification is in force and is followed up by wise action on the part either of local authorities or voluntary agencies, the most satisfactory consequences follow in regard to the health of both mothers and children. Such a measure, Mr. Long submits, is eminently justified at the present time. All the evidence shows that infant mortality is due far more to unsuitable and unsatisfactory feeding than to the insufficiency of food.

LONDON, July 23, 1915.

The War

SIR WILLIAM OSLER ON WOUNDS AND DISEASE IN WAR

Sir William Osler has contributed to the *Quarterly Review* an interesting survey of wounds and disease in the war. He states that for the first ten months of the war the killed number 50,432, the equivalent of the annual toll taken in England alone by one bacillus, that of tuberculosis. Of the 153,980 wounded, up to date 60 per cent. have returned to duty. The returns for disease are not yet available, but when the analysis is completed, he thinks that we shall find that coughs and colds, pneumonia, rheumatic fever, bronchitis and muscular rheumatism, particularly what is known as "trench rheumatism," have been responsible for a large proportion of the sickness. More suppurating wounds have been seen by British surgeons in ten months than in forty years since Lister's methods became general. The nature of the commoner wounds due to shell and shrapnel favor infection, and in spite of early first-aid dressings, the germs are carried far into the tissues, and suppuration is inevitable. Trench warfare can never be aseptic. The uniforms of the men are caked with mud, which in highly cultivated districts always contains dangerous micro-organisms, so that any wound, however slight, unless treated immediately, becomes infected. The one bright feature has been the frequency with which the high-velocity bullet sterilizes its course so that from many of the perforating wounds of the chest, abdomen and limbs there is recovery without suppuration. In the early days of the war, no feature was more distressing than the number of cases of tetanus; but medical science provided a remedy. Orders were received that at first-aid stations all wounded were to receive a protective antitetanic vaccination. No single feature of the campaign has been more gratifying in its results. Since every wounded man has received at the first dressing station a protective inoculation, the disease has been checked.

HIGH DEATH RATE AMONG THE WOUNDED

A painful impression has been created by the statement of Mr. Asquith in Parliament that the death rate among the wounded was 24 per cent., a percentage higher than that of the Crimean War, which was 22, although the sanitary conditions were then appalling. In the Franco-German War of 1870, the introduction of antiseptics enabled the Germans to treat their wounded with a loss of only 17.5 per cent. The explanation of the present high mortality is that the struggle on the West has entirely taken the form of trench fighting, in which most of the injuries are due to shells and shrapnel. Wounds from rifle bullets are comparatively rare, and when they do occur the body is so sheltered by the trenches that it is generally the head which is hit, and the probability of fatal results is consequently much greater. The most terrible feature of the present war is the fact that in many cases it is impossible to give timely help to the wounded. The trenches face each other at very short distances. An attack is delivered, and the mass of the wounded fall on the unsheltered space between the trenches. When the struggle is over, this space is carefully watched and the slightest movement brings a volley. At night only, when favored by darkness, some of the wounded may be able to crawl back to their trenches. The fact that aid reaches the wounded very late, if at all, accounts for the high death rate.

THE WOUNDED ALLIES' RELIEF COMMITTEE

Among the many benevolent organizations for the relief of the suffering created by the war, the Wounded Allies' Relief Committee stands in the front rank. It was formed in London soon after the outbreak of war, with the approval of the war office and admiralty and of representatives of the allied powers. Its earliest act was the escorting to England of the first batch of Belgian wounded, for 1,600 of whom it found hospital accommodation. A register of the men's names, addresses and regimental details was compiled, an inquiry bureau was established to assist the reunion of scattered families, and a military postoffice working in connection with the Bureau de Correspondance Belge at Havre, was set up. The register, which records over 100,000 names, has been continued at the request of the British registrar-general, and is partly subsidized by the local government board. It is consulted by the Belgian government for all military purposes, such as the tracing of soldiers destined to return to the front, the granting of pensions, etc. For those Belgian soldiers who are permanently disabled, the committee has provided three homes. To numerous crippled soldiers it has supplied artificial limbs and surgical appliances. It has in process of equipment a home for men who, through exposure in the trenches, have contracted tuberculosis. In Belgium itself the committee supports a fleet of motor ambulances and a number of caravans equipped with hot baths, soup kitchens and disinfectors. In France it maintains and manages two hospitals—at Dieppe and Limoges—which have a total accommodation of between 200 and 300 beds. At a time when the Serbian Red Cross organization was in great straits, the committee dispatched $2,500 by telegraph, and later, at the request of the Serbian government, equipped and sent out a typhoid hospital, with the result that at the end of March, doctors, nurses, a hundred beds and full equipment left for Kragujevatz, the headquarters of the Serbian army. Owing to the disappearance of the epidemic, the unit is now adapted for the reception of the wounded. The committee dispatched a sanitary commission to Montenegro, and on its advice two units of 100 beds each were sent, June 2, to combat typhus in Podgoritza and Nikshich. These units, owing to the state of Montenegro, had to take with them over $12,500 worth of stores and food.

Effect of Celibacy and Marriage on Cancer Among Women

At the annual meeting of the Imperial Cancer Research Fund, an important report was made on this interesting question. From time to time attempts have been made to discover whether the incidence of cancer of the ovary, breast and uterus is different in married and in single women. These attempts have been based on an analysis of the hospital and operation statistics, and have not led to a clear result. The registrar-general's report for 1913 deals with the question on the basis of the national mortality figures. This is the only satisfactory method, because the number of lives at risk in the two groups is known sufficiently accurately to permit of actual death rates being calculated. The tables show a curious result. Cancer of the ovary and breast are more frequent in the single while cancer of the uterus is more frequent in the married.

BERLIN LETTER

BERLIN, June 29, 1915.

The War

LOSSES IN THE PROFESSION FROM THE WAR

According to the official lists, Nos. 1 to 250, 154 physicians haven fallen, 72 succumbed to illness and one to gas poisoning; 261 have been slightly wounded and 82 severely; 70 have been captured by the enemy, and 93 are missing (probably mostly captured). A comparison with the losses in the profession among the other belligerents cannot be made, as the Russians and French do not publish any official casualty lists, and in the English official lists that have come to our knowledge in Germany, no special mention has been made in regard to medical officials.

FEEDING THE PRISONERS OF WAR

The war department recently organized a course of instruction for the officials in charge of the concentration camps of war prisoners. The chief aim of the course was to instruct the officials in the essential principles of the physiology of nutrition and the art of cooking. The officials came from 129 different concentration camps, from all over Germany, and leading specialists delivered lectures on the scientific bases for and the practical features of the feeding of the prisoners. Dr. Neumann, director of the institute at Berlin for research on the utilization of grains, spoke on the essentials of bread as food. This is a particularly difficult subject as the bread ration has had to be reduced for the prisoners as well as for the civilian populace. As the French and Russians are accustomed to make much use of bread, the minister of war had large amounts of second grade rye and wheat, which were not suitable alone for making bread, mixed with other kinds of flour. This mixed flour was used to bake a supplementary bread supply for the concentration camps where it was sold to the prisoners through the canteens for 50 pfennigs per kilogram or, as rolls or cakes, by weight, 75 gm. for 5 pfennigs. It can also be supplied gratuitously, on a physician's order, to certain undernourished persons and certain others engaged in manual labor. The standard dietary suggested by the minister of war is, for every prisoner of war, military or civilian, 85 gm. albumin, 40 gm. fat and 475 gm. carbohydrates, a total of 2,700 calories. Those who have to do manual labor, particularly the inmates of the work camps, are to receive 10 per cent. more. This ration is to be given in three nourishing and palatable meals: in the morning, coffee with 30 gm. of sugar, or a soup containing 100 gm. of solids. A soup has proved particularly satisfactory that is made of 30 gm. soy beans, 60 gm. flour (*Stärkemehl*) and 10 gm. fat. The dinner is to consist of 750 gm. potatoes and 300 gm. fresh or canned vegetables or 40 gm. dried vegetables. Every third day meat is to be given with the above. It was recommended to give fresh meat twice to corned meat once. The amount is prescribed as 120 gm. meat with bones or 100 gm. without bones. On the two intervening days, 200 gm. fish is recommended or 150 gm. pod vegetables, with the addition of bacon, fat or pickled meat. Soy beans in the form of flour were particularly recommended. Salt, spices and fat are not to be spared. For supper, baked potatoes with herring or sausage or cheese have proved satisfactory; the potatoes can be given in the form of a salad. Thick soups made from beans or flour have also proved useful for supper. Rice with baked or stewed fruit may also be used. Opportunity for tea drinking is given the Russians. Where skim-milk is obtainable, it shall be supplied abundantly to the prisoners. It was emphasized that the tastes of the prisoners should be considered as much as possible in the selection and preparation of the dishes.

Other speakers discussed the keeping of foodstuffs, adulteration and testing, management of the canteens, the importance of sugar, and other matters which showed the efforts of the military authorities to promote the welfare of the prisoners. Each noon there was a demonstration of cooking for the camp. In the afternoon there were discussions or visits to camps in the vicinity. In this way the camps at Buch and at Frankfurt a. O. were visited. There was also an interesting exposition of charts of the camps, and articles made by prisoners, wood, woven and metal articles and drawings. The French in their drawings, which sometimes show much humor, have not spared their allies, the English and Russians.

AID FOR DISCHARGED ARMY PHYSICIANS

Appeals have been made to collect funds to retrieve the pecuniary losses of physicians who have gone to the front. It has been hoped to collect 500,000 marks ($125,000), and one-half of this amount is already pledged by the Medical Chambers for Berlin and the province of Brandenburg and the majority of the social insurance companies. The other half is to be raised by subscriptions from physicians and scientific associations. The indemnities are to be paid after the end of the war. The plan is to give each physician enough to support him for three months at least when he returns home after the war. The minimum has been placed at 1,000 to 1,500 marks ($250 to $375) for each physician. It is impossible to estimate at present how many will have to be aided in this way. The appeal for subscriptions to the fund has met with a gratifying response. Several physicians have contributed each from 500 to 1,000 marks ($125 to $250).

BERLIN, July 7, 1915.

Vaccination Against Typhoid and Cholera

The larger part of the entire German army, if not the whole, has now been vaccinated against typhoid and cholera. With improved technic the reaction to the typhoid inoculations has grown less and less, especially to the second inoculation. Even when certain clinical manifestations occurred, they had all subsided by the third day. The inoculations only rarely interfered with the men's military duties and then only transiently. In a few cases there was transient diarrhea. It is interesting that in those suspected of tuberculosis or with bronchitis, the reaction was more pronounced and expectoration increased. It is a question whether this is a general reaction, like those in infectious diseases when diphtheria antitoxin is given, or whether it is a special reaction to the typhoid toxin, as we know that typhoid regularly affects the organs of respiration. It is impossible to say as yet what influence the vaccination has on those already affected with typhoid. One fact is certain, however, that there is very little typhoid in the army, and it is growing less. It must be taken into account, however, that the curve of incidence of typhoid had already shown a spontaneous decline before the inoculations. The danger of the so-called negative phase is proving less than was at first supposed on theoretical bases. Vaccination against cholera has proceeded more easily than the antityphoid inoculations. With this, also, diarrhea occurred in a few instances.

EXCELLENT HEALTH OF THE ARMY

On the whole, the health of the army is excellent. The progress realized in this respect by modern hygiene, and especially by bacteriology, compared with conditions in former wars, must be regarded as an enormous advance. This extraordinarily gratifying state of affairs is certainly due in part to the ample supply of the army with medical men. There is not only no lack of physicians with the army but at times and at certain places there is an actual superfluity of medical men, as is evidenced by the letters from physicians at the front. At the same time we in the home zone can scarcely estimate the justification for such assertions. We must not forget that at any time there may be an unexpected influx of wounded requiring adequate medical care. These questions will have to be left for solution till the end of the war. So many physicians are serving in the field that there is no doubt that many points in the home zone are feeling the lack of medical men, yet nowhere has there been any serious trouble and where inconvenience has been experienced it has been only temporary. At the same time the inconveniences complained of have brought it about that a number of physicians have been stationed in various places in the home zone instead of at the front.

As in all matters in these war times, the women have helped out also in the medical service. Medical women have been employed in hospitals and some (although in isolated cases) are serving in field hospitals. The news item is not correct that the wife of Professor Helbing, who is an orthopedist like her husband, has been serving as a military woman medical officer. Frau Dr. Schüler-Helbing merely served as assistant to her husband, who is in charge of a large military hospital here, and even this service soon came to an end. Perhaps her dismissal was influenced by the erroneous notice in the press of her appointment, for the authorities here, and especially the military authorities, are very sensitive about communications of that kind which might be interpreted as advertising.

Antituberculosis Measures

Notwithstanding the war conditions, the German Central Committee for the Campaign Against Tuberculosis held its general meeting in June, here. It was stated that the number of sanatoriums for adults is now 161, with 16,083 beds, so

that, with an average three months' course of treatment, 64,332 patients can be given treatment during the year. In addition there are 161 sanatoriums for children, 139 forest day sanatoriums and 15 forest schools. There are also 5 agricultural colonies for adults and children, 37 convalescent homes, 77 observation stations and 14 passage stations, 314 hospitals for tuberculosis or tuberculosis wards in general hospitals, convalescent homes and sanatoriums. The number of dispensaries for imparting information and giving aid is now 1,145, not including the 604 Baden institutions, the 154 in Thuringia, the 83 in Bavaria and the numerous ones in Saxony. A large number of the sanatoriums and forest stations are at present given over to military purposes for the care of soldiers with pulmonary disease. In 1914 the government contributed to the Central Committee 110,000 marks ($27,500). The subsidy had never been over 60,000 marks ($15,000) in the preceding years. The lottery held in 1914, the third organized by the Central Committee, was a success in spite of the war, bringing in the full receipts, namely, 125,000 marks ($31,250). About 96,300 marks ($24,075) were paid out during the year for erecting sanatoriums or other tuberculosis institutions, and contracts have been signed for others to the total of 83,750 marks ($20,937.50).

Dogs for Field Work

Dogs are used now for seeking the wounded to a greater extent than in any previous campaign. The newspapers have reported that there are 1,700 "sanitary dogs" "serving" at the front. They are mostly German shepherd dogs.

BUDAPEST LETTER

BUDAPEST, June 10, 1915.

The Treatment of Tetanus

At the Gesellschaft der Aerzte Vienna, Dr. Wiesel, lecturer of the university, discussed the question of the treatment of tetanus. This method of treatment is that practiced in the clinic of Professor Eiselsberg. Lately he treated thirteen patients, of whom ten died, one recovered, and two are still under treatment. All the cases have set in after severe injuries, mostly after shrapnel shots. The incubation period varied between four and thirteen days. In every instance he immediately gave a prophylactic injection of from 100 to 200 units of serum, and this dose was repeated the next day; the injection is mostly made intraspinally, in one instance intravenously, in four instances intraspinally and endoneurally. The patient who recovered was treated by the last-named method, and besides this, with morphin, chloral hydrate (8 gm. a day) and magnesium sulphate several times daily, to a total of 80.3 c.c. subcutaneously, in a 25 per cent. solution. In two instances he made experiments with salvarsan, and in a few instances the wound was strewn with chlorinated lime, on advice of Riehl. Wiesel does not highly esteem the action of the serum as a result of his and Eiselsberg's experiences, but he said that the antitoxin ought to be used on a much larger scale as a prophylactic.

Riehl had excellent results with chlorinated lime in cases of snake bites, and recommends chlorinated lime mixed with kaolin in the ratio of 1:10.

Paltauf has a high opinion of the prophylactic use of the serum, though he doubts its curative effect. The same opinion is held by Schnitzler. Professor Ortner recommended the Baccelli method: the subcutaneous injection of 5 or 6 c.c. of a 3 per cent. phenol (carbolic acid) solution.

A Hungarian Professor on American Medical Science

Dr. Kornel de Korossy, who recently returned from a visit to America to study the state of medical sciences there, describes his experiences in the *Orvosi Hetilap*, a summary of which follows: In America the experimental medical sciences and biology have reached in a relatively short time a very high level. We often hear, even in America itself, that the attained results are not in proportion to the number and greatness of the institutions. This statement can be based only on a total misunderstanding of conditions. In the first place, we must not measure by the number of so-called scientific discoveries alone, because whether or not a scientific experiment research ends in discovery, and whether or not it is of great practical importance, sometimes depends merely on extraneous circumstances. The question involves the attitude toward science, and we find that Americans are cultivating science with no less earnestness and love than are Europeans. In the second place, we must not forget that American medical science has had only a short past. Western Europe has learned that the mutual interchange of American and European scientific thought can be of great profit to both parties, and therefore the exchange professorships were established. It is to be desired that similar scientific interchange may take place between Hungary and the United States.

Europe can follow America's example by cultivating the great will power with which Americans endeavor to develop scientific research and instruction, by correcting existing faults, by persevering with unselfish diligence in cultivating science, and finally by a rational organization of scientific life.

PARIS LETTER

PARIS, July 15, 1915.

The War

SIMULTANEOUS EXCHANGE OF FRENCH AND GERMAN INVALID PRISONERS OF WAR

After long and difficult negotiations, the French and German governments have come to an agreement with regard to the simultaneous return to their homes of war invalids. According to the terms of the arrangement just concluded, the following classes are to be freed:

A. Soldiers of the rank and file affected with one of the lesions, infirmities or diseases specified: (1) total or partial loss of one or more members (at least the foot or the hand); (2) loss of use of a member by ankylosis, paralysis, atrophy or muscular retraction, pseudoarthrosis or lesions of the spinal column greatly interfering with movement; (3) paralysis which is important by its location or its extent; (4) cerebral lesions with serious consequences (hemiplegia or alteration of the cerebral functions); (5) medullary lesions with serious consequences (paraplegia or various paralyses); (6) loss of the sight of both eyes; (7) important mutilations of the face and serious lesions of the buccal cavity; (8) permanent cachectic condition due to wounds; (9) advanced pulmonary tuberculosis; (10) cachectic condition produced by other internal affections; (11) incurable mental diseases.

B. Officers, commissioned or noncommissioned, affected with 1, 4, 5, 6, 7, 8, 9, 10 or 11 of the conditions mentioned above.

The wounded and sick to be sent home are to be assembled at Constance and at Lyons. The first groups have just been started from both sides toward their respective homes, July 10 and 11.

LIBERATION AND RETURN HOME OF THE FRENCH AND GERMAN MEDICAL PRISONERS OF WAR

The members of the French medical service captured by German troops having been, as a general thing, retained in captivity, the government of the republic likewise decided to keep in France the members of the German medical service who have fallen into the hands of our army. Negotiations which have been carried on fruitlessly for a long time have at last resulted in an agreement for the simultaneous liberation of physicians, chaplains, pharmacists, administrative officers of the medical corps, nurses and orderlies of the two belligerent armies except those who are provisionally retained to care for the sick and wounded prisoners of their own nationality. A certain number of physicians and nurses traveled with the seriously wounded prisoners who began to leave Constance July 10 and Lyons July 11. The others will be returned home in special convoys interspersed between convoys of war invalids.

MEASURES AGAINST MALINGERERS IN THE ARMY

The minister of war has just sent to the regional directors of the medical service a circular calling attention to the fact that some men, in order to go to the hospital, take picric acid and thus appear to be affected with jaundice. It is easy to detect this simulation by means of one of the following reactions for picric acid in the urine:

1. The addition to the urine (which has previously been rendered alkaline by sodium hydroxid) of a few drops of a 20 per cent. solution of potassium cyanid gives an intense reddish-purple color on warming.

2. If 100 c.c. of urine be shaken with 10 c.c. of ether, the solvent becomes colored yellow. A scrap of white wool wet for an hour in the decanted ether takes on a yellow color which resists washing in water. The wool becomes colored red when treated with ammonium sulphid.

The attention of the minister of war has also been called to the rather large number of wounds of the fingers and toes, principally of the thumb and index finger, which are of such nature as to arouse suspicion that they have been produced by the subjects themselves, desirous of escaping their

military duty at the cost of a slight wound. The minister requests the medical staff to report all wounds of this character, and requires that investigations be instituted where possible, so that, if culpability be established, the severe punishment authorized in such cases may be inflicted.

WOUNDS OF THE SKULL BY FRAGMENTS OF SHELL

Many wounds of the head caused by fragments of shell look like insignificant wounds of the scalp, while since the skull bones are involved, the prognosis is much more serious than might be thought at first. Professor Oui of Lille has recently reported a remarkable example to the Académie de médecine. A soldier was wounded in the head by a very small fragment of a shell; the wound was for a long time considered trifling. In reality, the scalp wound hid a small fragment of shell which had fractured the parietal bone, so embedding itself as to make the interior of the skull bulge in contact with the dura mater. This wound caused an infection first of the meninges, then of the brain, with formation of an abscess compressing the motor centers of the upper and lower limbs; it was not recognized because the scalp was not laid open at first. Consequently, Dr. Oui, who ultimately had to trephine in this case, believes that it is always prudent to open up the wound in cases of wounds of the scalp by fragments of shell. This little operation has no disadvantages and its advantages are considerable, since it permits the discovery and early treatment of a deep wound of the head.

AID FOR TUBERCULOUS SOLDIERS

In a previous letter (THE JOURNAL, May 29, 1915, p. 1861) I mentioned the report of Professor Landouzy, dean of the Faculté de médecine de Paris, with regard to tuberculous soldiers. The Chamber of Deputies has just passed a bill making a special appropriation of 2,000,000 francs ($400,000) for soldiers discharged or about to be discharged for tuberculosis. This is intended for the care of tuberculous soldiers before they are sent home to their families and for their sanitary education, as well as for the improvement of their condition.

FOUNDATION OF A MUSSULMAN HOSPITAL

The society Les Amitiés musulmanes has founded, on the avenue de Neuilly near Bois de Boulogne, a hospital for African soldiers where Mohammedans will find not only devoted care, but something in their surroundings which will remind them of their native country. This hospital, which has just been opened by the president of the republic, contains 100 beds with a surgical service, a prothesis service and a research laboratory.

A New Prize of the Academy of Medicine

The Académie de médecine has just been authorized to accept the bequest of 8,000 francs ($1,600) left to it by M. Sigaut. The interest is to be used for a prize which will be called "the prize of Dr. Max Sigaut," and will be awarded every two years for the best paper on the early diagnosis and the best treatment of cancer of the alimentary canal.

Marriages

ROBERT CARNAHAN KIRKWOOD, M.D., Chicago, to Miss Elna Rasmussen of Lakeview, Wash., at Seattle, June 29.

JOHN HARLAN BRIDENBAUGH, M.D., Sioux City, Iowa, to Miss Jennie F. Nelson, at Sioux City, Iowa, July 14.

JEREMIAH JOSEPH BOYLE, M.D., Cambridge, Mass., to Miss Julia Theresa Shean of Arlington, Mass., July 21.

MERRILL WORTH GRUBB, M.D., Galva, Iowa, to Miss Lelah Helen Baldwin of St. Thomas, N. D., July 16.

WILLIAM FREDERICK MEYER, M.D., Eagle River, Wis., to Miss Elizabeth Blong of Phelps, Wis., July 12.

FRANK GOLDENBERG, M.D., to Miss Esther Jacobs, both of Cincinnati, at Avondale, Cincinnati, July 19.

THOMAS REESE FOSTER, M.D., Watseka, Ill., to Miss Edna May Gray, at San Francisco, June 30.

BERNARD FORD LOWRY, M.D., Cleveland, to Miss Jean M. Shafer of Akron, Ohio, July 30.

EDWARD SUTPHEN POPE, M.D., to Miss Margaret Muir, both of New York City, July 20.

PAUL F. KISTNER, M.D., to Miss Lillian Marie Linton, both of St. Louis, July 17.

Deaths

Charles Parker Hooker, M.D. Harvard Medical School, 1879; aged 60; a Fellow of the American Medical Association; of Springfield, Mass.; one of the first members of the staff of the Springfield Hospital and later of the House of Mercy Hospital; for thirty years county physician of Hampden County; one of the organizers and a director of the Springfield Medical Club and for several terms president of the Springfield Academy of Medicine; died at Fortune Rock, Biddeford, Me., July 21, from heart disease following pneumonia.

John Wesley Gresham, M.D. Kentucky School of Medicine, 1895; aged 42; a fellow of the American Medical Association and vice president of the Madison County, Tenn. Medical Association; local surgeon for the Mobile and Ohio Railroad and Brotherhood of Locomotive Engineers and Brotherhood of Locomotive Firemen at Jackson, Tenn.; fell downstairs at his office July 15, as the result of a sunstroke, and died from cerebral hemorrhage in the Crook Sanitarium, Jackson, eight hours later.

Gaylord Eugene Pitts, M.D. Northwestern University Medical School, 1911; aged 34; of Mt. Horeb, Wis.; formerly a Fellow of the American Medical Association; a member of the State Medical Society of Wisconsin; while driving across the Northwestern tracks, about 1 mile west of Mt. Horeb, to make a professional call July 27, was struck by a passenger train, and sustained a fracture of the base of the skull, as a result of which he died in the Madison General Hospital, a few hours later.

Howard Wells, M.D. Jefferson Medical College, 1870; aged 66; captain and medical director, U. S. Navy, retired; a Fellow of the American Medical Association and a member of the Association of Military Surgeons of the United States; formerly assistant demonstrator of anatomy in his alma mater, and assistant at the clinic of Dr. J. M. Da Costa; an expert in hospital organization; died in a private hospital in Oak Lane, Philadelphia, July 16.

Benjamin Gleeson, M.D. Rush Medical College, 1902; aged 38; a Fellow of the American Medical Association and a member of the American Academy of Ophthalmology and Oto-Laryngology and Aesculapian Society of the Wabash Valley; oculist and aurist to St. Elizabeth's Hospital, Danville, Ill.; oculist to the Chicago and Eastern Illinois Railway and the Illinois Traction System; at one time a pharmacist; died at his home in Danville, July 18.

John B. Bond, M.D. Washington University, St. Louis, 1866; aged 77; of Little Rock, Ark.; surgeon in the Confederate service throughout the Civil War; for many years a practitioner and druggist of Little Rock; one of the organizers of the Arkansas Association of Pharmacists; for twenty years a member of the State Board of Pharmacy and for the last fifteen years its president; died at the home of his daughter in Warren, Ariz., July 16.

Frederick A. Conradi, M.D. Baltimore University School of Medicine, 1892; aged 68; formerly a member of the American Medical Association; a member of the Medical Society of the Faculty of Maryland; for more than twenty years pastor of the first German Evangelical Lutheran Church, Baltimore; died in Mercy Hospital, Baltimore, July 17, from carcinoma of the stomach.

Albert Merrell, M.D. American Medical College, Eclectic, St. Louis, 1875; aged 72; for many years a practitioner of St. Louis where he served for twelve years as a member of the State Board of Health and the St. Louis Board of Health; a veteran of the Civil War; organizer of the Pure Milk Association of St. Louis; died at his home in Wilmington, Del., July 21.

Alexander Morrow Speer, M.D. Jefferson Medical College, 1853; aged 84; a member of the Medical Society of the State of Pennsylvania; surgeon of the Seventh Pennsylvania Volunteer Infantry and afterward brigade surgeon throughout the Civil War; a specialist on diseases of the eye, ear, nose and throat; died at his home in Pittsburgh, July 19.

Thomas M. Bridges, M.D. Louisville Medical College, 1878; aged 62; assistant division surgeon for the Oregon Short Line Railway; for many years physician at the Ross Fork, Ida. Indian Agency; died in his office in Idaho Falls, Ida., July 22, from the effects of a gunshot wound of the head, self-inflicted, it is believed, with suicidal intent.

Alexander Bradson Peters, M.D. University Medical College of Kansas City, Mo., 1883; formerly mayor of Mankato, Kan.; for many years local surgeon of the Rock Island System at that place and state grand medical examiner for the Ancient Order of United Workmen; died in his office in Mankato, July 20, from heart disease.

Charles Carroll O'Brion, M.D. Medical School of Maine, Brunswick, 1881; aged 66; formerly a member of the Maine Medical Association, New Hampshire Medical Society and New York Academy of Medicine; chairman of the Board of Health of Groveton, N. H.; for nearly thirty-five years a practitioner of Groveton; died at his home, July 16.

John Marcus Cargill, M.D. Howard University, Washington, D. C., 1891; aged 69; prior to his medical course a minister of the African Methodist Episcopal Church; a member of the City Council of Baltimore in 1895 and 1896; one of the founders of Provident Hospital; died at his home in Baltimore, July 13.

William H. Stennett, M.D. Homeopathic Medical College, St. Louis, 1869; aged 82; for forty-three years an official of the Chicago and Northwestern System where he had been successively general passenger agent, assistant to the general manager and auditor of expenditures; died at his home in Oak Park, Ill., July 22.

L. M. Bickmore, M.D. Medical College of Ohio, Cincinnati, 1860; aged 77; a veteran of the Civil War; at one time professor of obstetrics and gynecology and later dean of the American Eclectic Medical College of Ohio, Cincinnati; died at his home in San José, Calif., July 13, from valvular heart disease.

Archibald Duncan McEachran, M.D. University of Toronto, Ont., 1902; aged 41; a Fellow of the American Medical Association; for thirteen years chief surgeon and superintendent of the Detroit Sanitarium and local surgeon to the Pere Marquette Railroad; died at Pearl Beach, Mich., July 10.

Milton M. Butler (license, Nebraska, 1891), aged 70; a Fellow of the American Medical Association; mayor of the city of Weeping Water, Neb., and president of the Weeping Water Academy; for forty-two years a practitioner of Weeping Water; died at his home, July 21, from heart disease.

William Mitchell Bell, M.D. Missouri Medical College, St. Louis, 1873; aged 64; a Fellow of the American Medical Association; died at his home in Phoenix, Ariz., about July 13. At his funeral on July 15, the pallbearers were selected from members of the Maricopa County Medical Society.

Merrill Ellsworth Dawson, M.D. Cleveland College of Physicans and Surgeons, 1895; aged 51; for many years a practitioner of Xenia and Newark, Ohio, but recently retired and a resident of Loranger, La.; was accidentally drowned while fording the Tangipahoa River, July 18.

Royal Jerome Eddy, M.D. University of Vermont, Burlington, 1868; aged 72; a member of the Medical Society of the State of New York; founder and a member of the medical staff of the Glens Falls, N. Y. Hospital; died at his home in Glens Falls, May 6.

Jacob Henry Frankenberg, M.D. College of Physicians and Surgeons in the City of New York, 1883; aged 54; of New York City; a member of the Medical Society of the State of New York; died at his summer home in Cedarhurst, L. I., July 27, from heart disease.

Greene M. Smith, M.D. American Medical College, Eclectic, St. Louis, 1878; aged 61; for many years a practitioner of Lincoln, Neb., where he was supreme medical director of the Sons and Daughters of Protection; died at his home in that city, July 14.

Albert Joseph Lacier, M.D. College of Physicians and Surgeons, Baltimore, 1889; aged 52; for more than a quarter of a century a practitioner of northwest Baltimore and a member of the staff of the Hebrew Hospital; died at his home July 22, from pneumonia.

Oliver C. Edwards, M.D. McGill University, Montreal, 1873; aged 63; originally a resident of Ottawa, Ont., but Indian physician for thirty years; died at his home at the Indian Blood Reserve, near Macleod, Alta., April 4, from disease of the intestines.

Bascom Benson Smith, M.D. Bellevue Hospital Medical College, 1869; aged 75; a veteran of the Civil War; for nearly forty-five years a practitioner of North Side, Pittsburgh; died at his home in that city, July 21.

John H. Mahan, M.D. Memphis, Tenn. Hospital Medical College, 1890; aged 54; for thirty years a practitioner of Memphis, and one of the founders of the new City Hospital; died in St. Joseph's Hospital, Memphis, July 19, after a surgical operation.

Francis Waters Gallagher, M.D. University of Buffalo, 1877; aged 62; a Fellow of the American Medical Association; a practitioner of El Paso, Tex. until two years ago when he moved to Los Angeles; died at his home in the latter city, July 20.

George Aloysius Hofstetter, M.D. University of Michigan, Ann Arbor, 1897; aged 44; a Fellow of the American Medical Association; a practitioner of Corsicana, Tex., since his graduation; died at his home, July 16.

George Harvey Searcy, M.D. Medical College of Ohio, Cincinnati, 1891; aged 50; of Muncie, Ind.; who was operated on for the removal of gallstones, July 10; died in a hospital in Muncie, July 23.

Mathew McVickers, M.D. Queens University, Dublin, Ireland, 1880; aged 56; formerly of Wilkes-Barre, Pa., but for five months a practitioner of Pottsville, Pa.; died in the Pottsville Hospital, July 20.

Henry E. Hale, M.D. Hospital Medical College of Evansville, Ind., 1883; of McLeansboro, Ill.; a member of the Illinois State Medical Society; died July 6, after an operation for intestinal obstruction.

Orren Littleberry Ellis, M.D. Tulane University, New Orleans, 1855; aged 80; a Confederate veteran; died at his home in Louisburg, N. C., from an accidental overdose of medicine.

Henry Caroll Conley, M.D. University of Maryland, Baltimore, 1885; formerly a practitioner of Boone, Iowa; died in Tunnelton, W. Va., April 7, from chronic bronchitis.

Ziba Darlington Walter, M.D. Homeopathic Medical College of Pennsylvania, Philadelphia, 1866; aged 72; of Marietta, Ohio; died in a hospital in Philadelphia, July 19.

Margaret E. Hennessy, M.D. Hahnemann Medical College, Chicago, 1888; aged 58; of Utica, N. Y.; died in LaSalle, Ill., April 23, from carcinoma of the uterus.

Edward Ragsdale, M.D. Jefferson Medical College, 1868; for fifty-five years a resident of Lone Jack, Mo.; died at the home of his son in Lee's Summit, Mo., July 23.

Harvey Clements Keator, M.D. Long Island College Hospital, Brooklyn, 1891; aged 54; of Kingston, N. Y.; died in Rosendale, N. Y., May 25, from arteriosclerosis.

William Allison Slaugenhaupt, M.D. College of Physicians and Surgeons, Baltimore, 1885; aged 57; of Kane, Pa.; died in the Summit Hospital, Kane, July 21.

Clive Major, M.D. Medico-Chirurgical College of Kansas City, Mo., 1900; aged 54; died at his home in Seattle, July 16, from carcinoma of the stomach.

William R. Ruble, M.D. Eclectic Medical Institute, Cincinnati, 1887; aged 59; died at his home in Smith's Grove, Ky., July 21, from heart disease.

John Dowling Groves, M.D. Jefferson Medical College, 1884; of Philadelphia; died at his summer home in Westville, N. J., July 13, from laryngeal tuberculosis.

J. H. McCrory, M.D. University of Tennessee, Nashville, 1877; for many years a practitioner of Mayfield, Ky.; died at his home in that city, about July 10.

John H. Molloy (license, Arkansas, 1903), aged 69; one of the oldest practitioners of Carroll County, Ark.; died at his home in Berryville, Ark., July 17.

George W. Stephens, M.D. St. Louis College of Physicians and Surgeons, 1883; aged 66; of Montgomery City, Mo.; died in St. Louis, recently.

John P. Casey (license, Mississippi, 1883), for thirty years a practitioner of Wilkinson County Miss.; died at his home near Woodville, July 12.

Alvin Schellack, M.D. Kansas City (Mo.) Medical College, 1877; aged 76; died at his home in Eudora, Kan., July 13, from diabetes.

Sylvanus W. Tanner, M.D. Iowa Eclectic Medical College, Des Moines, 1892; aged 64; of Buffalo, Okla.; died in Watson, Mo., April 23.

Isidor Zippert, M.D. New York University, New York City, 1898; died at his home in New York City, July 14.

Sidney G. Pratt, M.D. St. Louis University, 1906; aged 36; of Kewanee, Ill.; died about July 9.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

ALFATONE

Report of the Council on Pharmacy and Chemistry

The Council has found Alfatone ineligible for New and Nonofficial Remedies and has authorized publication of the following report. W. A. PUCKNER, Secretary.

Alfalfa is good cattle feed but only nostrum exploiters have suggested its use as a medicine for human beings. While it may seem a waste of time to discuss the medicinal value of alfalfa its recent exploitation by the Norwich Pharmacal Company, Norwich, N. Y., as "a reconstructive tonic and nutrient" in the form of a mixture called "Alfatone," calls for comment. According to the label on the preparation:

"Each fluidounce represents:

Alcohol	15 per cent.
Medicago sativa (Alfalfa)	120 grains
Taraxacum	2½ grains
Gentian	1 grain
Berberine Hydrochloride	1/50 grain
Glycerin and Aromatics."	

"Dose.—One to three fluidrams (4 to 12 c.c.) 4 times daily."

Each maximum dose, therefore, should represent 45 grains of alfalfa, 1 grain of taraxacum (dandelion), 3/4 grain of gentian, 1/100 grain of berberin hydrochlorid, and 27 minims of alcohol. Since the bitter drugs are present in such small amounts that the preparation is almost devoid of bitterness, and as the medicinal value of alfalfa is practically nil, it is evident that whatever action Alfatone may have is due to the stimulant effects of the alcohol.

Some of the claims made for Alfatone, are:

"A reconstructive nutritive tonic indicated in general debility, neurasthenia, convalescence, etc."

". . . a Galactagogue of merit as well."

". . . improves the appetite, aids the processes of digestion and assimilation, facilitates elimination and effects gradual but decided gains in strength, vitality and weight."

It is suggested that:

". . . in case of idiosyncrasy the addition of Tr. Nux Vomica 5 to 10 minims to the dose, unless contra-indicated, will secure excellent results."

The Norwich Pharmacal Company naively remarks:

"The dearth of medical literature on Alfalfa has lead us to present below a few of the findings of the Bureau of Plant Industry of the Department of Agriculture . . . as well as those from several state experiment stations . . ."

Here are the "findings":

". . . Digestible nutrients in 100 pounds of Alfalfa, . . . Protein, 11.0 pounds; Carbohydrates, 39.6 pounds; Ether Extract, 1.2 pounds."

". . . The high value of Alfalfa is due to the amount of protein that it contains; to the large percentage of protein that is digestible and to the palatability of Alfalfa."

". . . Table showing pounds of elements removed from the soil by one ton of crop.

	Alfalfa	Wheat
Potash	49.79	12.52
Phosphoric Acid	8.27	9.08
Lime	43.51	2.95
Nitrogen	44.01	22.30"

". . . The abundance of muscle and bone producing material in Alfalfa makes this crop especially good."

Thus estimates of the value of a farm crop and cattle fodder are made to do service as testimonials to its therapeutic merit for human beings! Has the "patent medicine" promoter ever dared to insult the intelligence of his patrons by a cruder absurdity? Yet it is not to the non-technical and unscientific public, but to a profession presumably scientifically trained in pharmacology and therapeutics that this concern presumes to offer its fodder tincture on the basis of testimony to the agricultural value of the fodder plant.

Alfatone is a worthless alcoholic cordial. The audacity of the attempt to promote its sale by a discourse on the merits of a well-known fodder plant is the sole reason for devoting any attention to it. It is recommended that Alfatone be held ineligible for New and Nonofficial Remedies, and that this report be published.

[EDITORIAL NOTE.—What a comment on American medicine that a concern can even contemplate the possibility of making a commercial success of the sale of such a silly nostrum as Alfatone! And, yet, when one remembers that a proprietary in which oats constitutes one ingredient ("Pas-Avena") for years has been advertised to physicians and presumably prescribed by them, it is not altogether inexplicable that business men should get the impression that the medical profession is "easy" enough to "fall for" anything in the line of proprietary mixtures. Perhaps we may look forward to being offered proprietaries based on other cheap and well-known fodder plants. Tincture of Timothy Hay, Blue Grass Tonic, Cornhusk Wine! Why not? The enterprising companies that may put them out can easily publish tables to show the digestible nutrients in each and indubitable testimony can be furnished to prove the excellence of any of them as stock feed. If a pitchforkful of timothy hay makes a good fattening ration for a growing steer why should not a teaspoonful of tincture of timothy hay make a "reconstructive tonic and nutrient" dose for a man? If an arm load of thistles (carduus) makes a luscious food for *Equus asinus* why should not a pinch of thistle in alcohol and water be a good "tonic"? Great are the possibilities! They are limited only by the gullibility of the medical profession and the public. Certain it is that some proprietary manufacturers are firmly convinced that no combination can be too preposterous to be worth trying on the medical profession.]

THE HATTIE BIEL OBESITY CURE

Hattie Biel and Hattie Biel & Company were two names under which Mrs. Conrad E. Biel operated a fraudulent obesity cure. Mr. Conrad E. Biel seems to have been faking it in other lines. In addition to being the alleged manager of, and a stockholder in, the Modern Vacuum Cap Company, which was supposed to grow hair on bald heads, Biel also operated a complexion-beautifying and wrinkle-eradicating concern under the name of Verlie Gatlin. The Verlie Gatlin Company was declared a fraud by the federal officials, Dec. 29, 1914. Further, the Biel concern put on the market a "weak men" tablet as well as a preparation, "Plumpine," for making thin people fat. The idea of marketing both a fat reducer and a fat producer is a stroke of commercial genius. It should not only offer an opportunity to get the credulous "coming and going," but it should also cut down the "overhead expense" by making it possible to use the same "Before and After Taking" illustrations with a simple reversal of the labels.

Briefly, the Hattie Biel obesity cure, said to be an "Improved French Method," was an imitation of the Marjorie Hamilton fraud.[1] The price first asked was $10, which, to the reluctant, was reduced by easy stages to 25 cents! The postal authorities investigated the swindle and a fraud order was issued against Hattie Biel and Hattie Biel and Company, Oct. 12, 1914. To quote from the memorandum prepared by the solicitor of the Post Office Department for the Postmaster-General:

"Hattie Biel and Hattie Biel & Company advertise in newspapers and magazines of general circulation throughout the United States, representing in substance that Hattie Biel has discovered a wonderful remedy for obesity; that by means of this remedy she reduced herself in a short time from a woman of ungainly proportions to one of normal size; that this remedy is different from all others on the market, simple,

1. See pamphlet "Obesity Cure Fakes" (price 10 cents), published by the American Medical Association. The original article appeared in THE JOURNAL A. M. A., Dec. 13, 1913.

harmless, drugless and comprising no harmful exercises, sweat-baths or starvation diet; that by means of it one can 'weigh just what one wants to weigh' and eat 'all one wants to do'; and that to anyone who will send to them his or her name and address they will mail free a booklet disclosing the secret and enabling such person 'to reduce yourself and be just as happy as I am.'

"Instead of a revelation of this secret remedy, those who respond to the advertisement are sent a booklet consisting entirely of matter further advertising the treatment. . . ."

"With this booklet is a letter printed in imitation of typewriting in which representations similar to those quoted above are made, and it is further represented that 'with my treatment you at once become the master of your own body. You CONTROL your weight ever after. You can weigh just what you want to weigh—what you rightfully should weigh, you can have a shapely form. You can reduce the size of your Abdomen, Arms, Bust, Shoulders or other parts to their proper size';—and that 'age makes no difference, as it will reduce anyone between the age of 15 to 75 years of age or even older.'

"By subsequent letters the price of the treatment is reduced gradually until it is finally offered for a remittance of 25 cents.

"A copy of the 'Improved French Method for Reducing Superfluous Flesh' sold under the above representations is in evidence in the case. It consists of a loosely bound pamphlet of about 24 pages of matter printed in imitation of typewriting setting forth general statements as to the causes of fat and methods of removal. Exercise, bathing, the drinking of lemon juice and of Vichy and Kissingen waters, dieting and the use of enemas are recommended.

"Substantially the same system of treatment for obesity was sold by Walter C. Cunningham of Denver, Colo., under the name Marjorie Hamilton and the Marjorie Hamilton Company, against which names a fraud order was issued on Jan. 12, 1914. . . ."

Much stress was laid by the Hattie Biel concern on the claim that should the obesity cure not bring about the reduction desired the money that had been paid for it would be refunded. Federal officials refer to this "refund guaranty" thus:

"The evidence shows that, contrary to the representations made with reference to a refund of money to dissatisfied purchasers, the respondents, when a request for a refund is received, write the correspondent expressing great surprise that the treatment has been a failure and strive in every way to avoid making a refund, finally endeavoring to have the patron accept a supply of 'Slenderine,' a treatment for obesity manufactured by Hattie Biel's husband, in lieu of a refund."

The Post Office inspectors corresponded with a number of persons who had taken the Hattie Biel treatment and found that practically three out of every four of the individuals who had used the "cure" were dissatisfied with the results. It was brought out at the hearing that the Hattie Biel concern received on an average 283 pieces of mail daily.

After a thorough investigation, the solicitor for the Post Office Department recommended the issuance of a fraud order against the concern, and on Oct. 12, 1914, the use of the United States mails was denied Hattie Biel and Hattie Biel & Company.

Rural Waste Disposal.—From records of surveys already made, we know in general of two points of attack, namely, the crass ignorance which obtains as to necessity for sanitary disposal of waste, and the almost universal habit of taking "dope" medicine. That there are hundreds of homes in the rural districts without a closet, sanitary or otherwise, is a fact. If we knew the why of this condition, we could prescribe the remedy. Once I asked an old gentleman, who had a good home and a large and profitable farm, why he had not built a closet. After an embarrassed silence he answered, "We don't have them things." He looked as if I had touched a subject beyond the bounds of respectability. I have often wondered since if this isn't the attitude of mind of many people who have never known of the sanitary conveniences required by just common decency.—Oscar Dowling, *American Journal of Public Health*, May, 1915.

Correspondence

Metabolic Conjugation of Phenol and Sulphates

To the Editor:—In your excellent series on "Practical Pharmacology" (THE JOURNAL, March 27, 1915, p. 1071) it was stated that:

> Sodium sulphate was long supposed to be an effective antidote to phenol, with which it was said to form a sulphocarbolate. This reaction does not occur in the body, and one should avoid being misled by this popular fallacy.

In evident contradiction with this, THE JOURNAL (July 10, 1915, p. 174) stated editorially:

> Phenol is known to conjugate with sulphuric acid arising in metabolism and leave the organism in the form of an ethereal sulphate or sulphonate which appears to be comparatively harmless.

Should the editorial staff of THE JOURNAL not be asked to "brush up" on questions of practical pharmacology? Please omit my name if you publish this. P. A. W.

[COMMENT.—The editorial says, after referring to the supposed evidence for a metabolic conjugation of this sort, "It is questionable, however, whether the latter (phenol) combines with sulphates as such in the body." A careful reading of the two statements shows that, instead of being contradictory, they are confirmatory of each other so far as they refer to the same phenomenon. Ethereal sulphates may be formed in metabolism and excreted as phenylsulphates quite independently of any antidotal reaction such as that referred to.—ED.]

Syphilis of the Brain and Cord

To the Editor:—Referring to the paper by Dr. Joseph Collins and that by Dr. Swift I desire to offer the following observations from my own experience (THE JOURNAL, July 10, 1915, p. 139): In cases of nonsyphilitic tumor of the brain, the laboratory examination of blood and spinal fluid may indicate syphilis. Given a case with clear, positive history of syphilis, but with negative laboratory tests, the individual may suffer from tumor of the spinal cord or brain which is nonsyphilitic in character.

An individual who has had syphilis and whose blood and spinal fluid show positive tests for syphilis may suffer from a psychosis or various nervous affections which are not wholly due to syphilis. In other words, in the presence of mental and nervous disease, either organic or apparently functional in character, positive laboratory findings indicative of syphilis do not *necessarily* indicate that the disease from which the individual suffers is syphilitic in character.

At the present time it would appear that one very important treatment of syphilis is receiving less attention or less emphasis than its merits demand. I refer to the treatment by rest—rest of body and rest of mind. In the old days before Wassermann and salvarsan, I often saw tabetic patients greatly improved by a short rest in bed—even of a week or two. The general hygienic treatment of patients suffering from syphilis of the nervous system is of the greatest importance; and in these days of salvarsan, I fear there is some danger that it may be overlooked.

THEODORE DILLER, M.D., Pittsburgh.

An Improved Hemorrhoid Operation

To the Editor:—I notice in THE JOURNAL, July 17, 1915, p. 246, the description of an improved hemorrhoid operation by Dr. William Lee Secor. I have been doing this shoemaker stitch operation for the last ten years, as a number of Shreveport doctors can testify. I did not give it to THE JOURNAL in view of the fact that practically all stitch operations for hemorrhoids had been done and, although having never heard of this one, I did not claim originality.

A. P. CRAIN, M.D., Shreveport, La.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

WHITNEY'S REAGENT

To the Editor:—Please publish the formula for making Whitney's reagent for quantitative testing of the sugar in urine.

CLARENCE A. HOFFE, M.D., Metuchen, N. J.

ANSWER.—The formula of the standard solution (parts by weight) is:

	gm.
Ammonium sulphate (C. P.)	1.2738
Copper sulphate (C. P.)	2.5587
Potassium hydroxid (C. P.)	19.1620
Ammonia water (sp. gr. 8.80)	312.2222
Glycerin (C. P.)	60.
Distilled water	q. s.

One cubic centimeter of the reagent is the equiivalent of:

	gm.
Cupro-diammonium sulphate	0.03832
Cupric hydroxid	0.41062
Grape sugar anhydrous	0.00526

The following table gives the amounts of sugar in analytic testing:

If reduced by	It contains to the ounce:	Percentage
1 minim	16. grains or more	3.33
2 minims	8. grains or more	1.67
3 minims	5.33 grains or more	1.11
4 minims	4. grains or more	0.83
5 minims	3.20 grains or more	0.67
6 minims	2.67 grains or more	0.56
7 minims	2.29 grains or more	0.48
8 minims	2. grains or more	0.42
9 minims	1.78 grains or more	0.37
10 minims	1.60 grains or more	0.33

The method of procedure is the following: Heat 1 dram of the reagent in a test tube to boiling; add the urine slowly, drop by drop, until the blue color begins to fade, then more slowly, boiling from three to five seconds after each drop, until the reagent is perfectly colorless, like water, or until 10 drops only are added. On cooling, the reagent resumes the blue color, the change being due to the absorption of oxygen from the atmosphere. When the urine contains a large amount of albumin, the reduction takes place without interference by the albumin present, but leaves the reagent more or less of a yellow tint. A large amount of coloring matter has a similar effect. If the urine contains a considerable amount of sugar, it is best to dilute it from one to ten times.

Approximate estimations of this character are likely to give exceedingly irregular results.

DEFINITION OF "PARESIS"

To the Editor:—Please give me the generally accepted definition of the word "paresis." It seems that different doctors have different conceptions of the meaning of this word. Has the meaning of the word changed since it first came into existence? Does it mean "softening of the brain," or does it mean, as Dunglison says, "paralyses of different parts of the body"? A. D. C.

ANSWER.—There is no doubt some confusion regarding the exact meaning of the word "paresis." Owing to the prevailing tendency among the laity to abbreviate medical terms, the term "general paresis" was shortened into plain "paresis." At the present time the following may be considered synonyms: general paresis, dementia paralytica, general paralysis of the insane, "softening of the brain," paresis. Neurologists, however, indicate the slighter degrees of paralysis of muscles—a mere weakness, or diminution of muscular power—by the statement, "The patient suffers from paresis of certain muscles," or "His muscles are paretic." When referring to a patient suffering from general paresis, even neurologists speak of a "paretic." To summarize the accepted usage of the word in medical literature: When paresis stands alone, the disease general paresis (softening of the brain) is meant. The word "paresis" followed by the possessive "of the" means a slight degree of muscular paralysis. Instances: He suffers from paresis (softening of the brain). The patient suffers from paresis of the peroneal group of muscles (slight or incomplete paralysis of these muscles, no matter from what cause).

Medical Education and State Boards of Registration

COMING EXAMINATION

NEW HAMPSHIRE: Concord, September 15-16. Sec., Dr. Walter T. Crosby, Pembroke Building, Manchester.

"Unprofessional Conduct" in Ohio

The amendment which becomes effective July 26 modifies the Medical Practice Act of Ohio to include the following offenses which may be construed as instances of "grossly unprofessional or dishonest conduct," punishable by revocation or suspension of certificate:

1. The employing of any capper, solicitor or drummer for the purpose of securing patients, or subsidizing any hotel or boarding house with like purpose, or the obtaining of any fee on the assurance that an incurable disease can be cured.

2. The wilful betrayal of a professional secret. But a physician, knowing that one of the parties to a contemplated marriage has a venereal disease, and so informing the other party to such contemplated marriage, or the parent, brother or guardian of such other party, shall not be held to answer for betrayal of a professional secret nor shall such physician be liable in damages for truthfully giving such information to such other party, or the parent, brother or guardian of such other party.

3. All advertising of medical practice in which extravagantly worded statements intended, or having a tendency to deceive and defraud the public are made, or where specific mention is made in such advertisements of tuberculosis, consumption, cancer, Bright's disease, kidney disease, diabetes or of venereal disease or disease of the genito-urinary organs.

4. Having professional connection with, or lending one's name to an illegal practitioner of medicine.

5. Any division of fees or charges, or any agreement or arrangement to share fees or charges made by any physician or surgeon with any other physician or surgeon, or with any other person.

Before the enactment of this amendment the term "unprofessional conduct" was undefined, except by court interpretation. The only offenses previously mentioned were fraud in examination, commitment of felony or addiction to drug or liquor habits "to such a degree as to render the physician unfit to practice medicine or surgery."

Medical Cults Under Control of Medical Board

Another amendment to the medical practice law in Ohio, passed recently, imposes on the State Medical Board the duty of providing for the licensure of practitioners of the various medical cults. The law specifically mentions under this heading: chiropractic, naprapathy, spondylotherapy, mechanotherapy, neuropathy, electrotherapy, hydrotherapy, suggestive therapy, psychotherapy, magnetic healing, chirondy, Swedish movements, massage and "such other branches of medicine and surgery as the same are defined in Section 1286 of the General Code that may now or hereafter exist, except midwifery and osteopathy." Under the provisions of the law, the board is directed to call to its aid "person or persons of established reputation or known ability in the particular limited branch in which the examination is to be given." These limited practitioners will act as examining committees for the board. For example, to examine applicants for licenses to practice chiropractic, the board will appoint a committee of probably three chiropractors to be known as the Chiropractic Examining Committee. The law provides that if there is in existence a state association or society of practitioners in any limited branch, such association shall recommend the persons to be designated for this service by this board. The board in its discretion, however, may reject these recommendations.

Additional Fellowships at the University of Minnesota

It has been announced that with the opening of the fall session in September additional teaching fellowships in surgery, internal medicine, pediatrics and obstetrics will be offered in the Graduate Medical School of the University of Minnesota. These fellowships are said to be under stipends of $500, $750 and $1,000 for the respective three years of study they require.

The announcement states that candidates will be expected to devote eleven months in each year exclusively to work in a chosen specialty and will give a certain measure of teaching assistance in the subject. The relations established between the Graduate Medical School and the Mayo Foundation for Medical Education and Research enlarge the clinical opportunities of these fellowships. The course leads to the degree of Doctor of Science qualified by the specialty pursued.

Michigan May Report

Dr. B. D. Harison, secretary of the Michigan State Board of Registration in Medicine, reports the written examination held at Detroit, May 27-29, 1915. The total number of subjects examined in was 14; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 48, of whom 46 passed and 2 failed. The following colleges were represented:

PASSED		
College	Year Grad.	Per Cent.
University of Illinois	(1914)	80.9
Detroit College of Medicine and Surgery	(1915)	78, 78.7, 79.5, 79.7, 79.7, 81.9, 82.2, 82.3, 82.3, 82.5, 83, 83.3, 84.1, 84.2, 84.2, 84.3, 84.4, 84.4, 84.9, 85, 85, 85.1, 85.1, 85.4, 85.5, 85.7, 85.7, 85.8, 85.8, 85.8, 85.9, 86.1, 86.4, 86.6, 87, 87.6, 87.6, 87.9, 88, 88, 88.1, 89, 89.1.
University of Toronto	(1913)	87.5
Western University, London, Ont.	(1913)	80.6
FAILED		
Detroit College of Medicine and Surgery	(1915)	*, †

* Grade not given.
† Conditioned in one subject.

Rhode Island July Report

Dr. Gardner T. Swarts, secretary of the Rhode Island State Board of Health, reports the written examination held at Providence, July 1-2, 1915. The total number of subjects examined in was 7; total number of questions asked, 70; percentage required to pass, 80. The total number of candidates examined was 5, of whom 3 passed and 2 failed. The following colleges were represented:

PASSED		
College	Year Grad.	Per Cent.
University of Maryland	(1915)	87
Boston University	(1915)	80
Hahnemann Med. Coll. and Hosp., Philadelphia	(1915)	80.3
FAILED		
Atlanta Medical College	(1915)	77.3
Tufts College Medical School	(1908)	75.2

Utah July Report

Dr. G. F. Harding, secretary of the Utah State Board of Medical Examiners, reports the written examination held at Salt Lake City, July 7, 1915. The total number of subjects examined in was 20; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 7, all of whom passed. Three candidates were licensed through reciprocity. The following colleges were represented:

PASSED		
College	Year Grad.	Per Cent.
Rush Medical College	(1915) 81.3, 82.8, 83.4,	85.8
College of Physicians and Surgeons, Baltimore	(1915)	82.7, 82.8
Jefferson Medical College	(1914)	78.6

LICENSED THROUGH RECIPROCITY		
College	Year Grad.	Reciprocity with
University of Colorado	(1912)	Colorado
Rush Medical College	(1914)	Illinois
Long Island College Hospital	(1899)	New York

Book Notices

OVERCROWDING AND DEFECTIVE HOUSING IN THE RURAL DISTRICTS. By Dr. Harvey B. Bashore, Inspector for Pennsylvania Department of Health. Cloth. Price, $1 net. Pp. 92, with 15 illustrations. New York: John Wiley Sons, 1915.

This pamphlet is the outcome of a study made by Bashore under the authority of the Pennsylvania Department of Health. It deals principally with rural communities. The author believes that too much blame has been thrown on the factory and place of employment, and not sufficient attention paid to the homes of employees in preventing disease. The book is divided into five chapters which discuss land crowding, house crowding, defective building, defective schools and the results of these evils. In the rural districts Bashore finds that although there is no tuberculous section, there are many tuberculous homes. The cure for the housing evil, he believes, lies in education through an efficient visiting nurse service. The book is well illustrated, practically every other page being a plate showing the conditions studied.

A MANUAL OF PRACTICAL HYGIENE. Proper Living on a Physiologic Basis. By American Authors. Edited by Walter L. Pyle, A.M., M.D., Assistant Surgeon to the Wills Eye Hospital, Philadelphia. Sixth Edition. Cloth. Price, $1.50 net. Pp. 543, with 138 illustrations. Philadelphia: W. B. Saunders Company, 1915.

The sixth edition of the well-known manual is marked by two sections: one a chapter on food deterioration, by Wiley, and another on the hygiene of infancy, for which the author's name is not given. A footnote to the chapter by Wiley states that the contents are abstracts of his published works which have been edited and revised by Wiley himself. They contain much valuable information. The material seems, however, rather unorganized, and gives the impression of being rather hastily prepared. Many simple tests are given for the use of the housewife in determining the application of common articles of diet. The chapter on the hygiene of infancy contains within a few pages many simple and practical suggestions. This chapter is well illustrated, practically all the illustrations being taken from a book on this subject by Griffith. Several suggestions, it is to be feared, will not receive the approval of most pediatricians; for example: "If the baby is delicate, an alcohol, warm whisky, or olive oil rub is advisable." "The mouth should be washed daily, after the bath and after each feeding, by the mother's finger wrapped in absorbent cotton." Besides the chapters contained in previous editions, the book is supplemented by an appendix which states in simple language many basic facts and directions in physical therapy and first aid.

A PRACTICAL HANDBOOK OF SURGICAL AFTER-TREATMENT. By Alan H. Todd, B.Sc., M.S., F.R.C.S., Surgical Registrar, Guy's Hospital. Cloth. Price, $1.25 net. Pp. 256, with 37 illustrations. New York: Longmans, Green & Co., 1915.

In his preface, the author states that the contents of his book are based on his own experience as a dresser, house surgeon and registrar. As a handy reference book for students and hospital or dispensary dressers it can, in the main, be recommended. The subject matter is well classified, the illustrations sufficient and the "working tips" in many instances meritorious. One can heartily commend his warning (page 56) that "in hemorrhage from a tumor, vasoconstrictors are useless, for the vessels of a new growth have no vasoconstrictor in their walls." He also lays great emphasis on the all-importance of breathing exercises after adenectomies. The daily carrying out of nursing procedures and of feeding under anesthesia in severe cases of tetanus is also worthy of consideration. He advocates the open air treatment of burns, using a wire netting "bridge" as protection. The chapters on hemorrhage, bandaging, plaster splints and surgical massage are excellent. One must, however, criticize his evident fondness for proprietary drugs. Purgen, laxoni, glycothymoline, listerine and a host of other remedies of unknown or doubtful composition are equally

recommended with orthodox drugs of the pharmacopeia. On page 11 he recommends, as a preliminary to cystoscopy, that indigocarmin be injected into the subcutaneous tissues of the thigh "on the side opposite to that of the suspected lesion." We fail to recognize any anatomic or physiologic basis for such a statement. He also advises morphin or "nepenthe" rectal suppositories after operations on the bowel or pelvis, although the central action of all opiates has been a matter of common knowledge for several years. In spite of these minor drawbacks, the volume is well worth reading.

THE ELEMENTS OF MILITARY HYGIENE. Especially Arranged for Officers and Men of the Line. By P. M. Ashburn, Major Medical Corps, U. S. Army. Cloth. Price, $1.50 net. Pp. 331. Boston: Houghton Mifflin Company, 1915.

In these stirring times, in the midst of continued agitation for preparedness in military affairs, physicians should inform themselves concerning the essential elements of military hygiene. The increased interest in these subjects has demanded a new edition of Ashburn's excellent book. The revision has been thorough, and includes explicit statements of newer advances in our knowledge of the etiology and transmission of those infections to which troops seem particularly susceptible. A new chapter on the prevention of nervous and mental diseases in soldiers is of special interest. The author considers alcohol and syphilis the two chief factors in the production of psychoses and nervous disturbances in soldiers.

FRAGMENTS AND ADDRESSES. By Norman Bridge, A.M., M.D. Cloth. Price, $1.75. Pp. 332. Los Angeles: Bireley & Elson, 1915.

This collection of addresses and poems on various occasions is a revelation of the many-sidedness of Dr. Bridge. The fragments—and some of them seem worthy of a better name—include commencement and inaugural addresses, reprinted articles from several popular periodicals, some short stories written for children, and several poems. The articles are practically all distinctive in style—simple, direct and full of a wealth of humor and human kindliness. The author looks back on a life of varied activity and draws on a fund of anecdotes to embellish the lessons he would teach. The book is neatly printed. It contains an excellent photograph of the author which will be much appreciated by all who know him.

SOZIALE PATHOLOGIE. Versuch einer Lehre von den sozialen Beziehungen der menschlichen Krankheiten als Grundlage der sozialen Medizin und der sozialen Hygiene. Von Prof. Dr. med. Alfred Grotjahn. Second Edition. Paper. Price, 15 marks. Pp. 532. Berlin: August Hirschwald, 1915.

This book, the first edition of which was published in 1912, gives an excellent presentation of the social relations and importance of the human diseases, with special reference to German conditions. It should interest all who are working and thinking in the direction of the social aspects of medicine.

Miscellany

Decline in Stamina of American Workers

E. E. Rittenhouse, of the Life Extension Institute, in a recent address says that mortality records indicate a marked decline in the power of American workers to withstand modern life. This is manifested in the extraordinary increase in the death rate from the breaking down of the heart, arteries, kidneys and the nervous and digestive systems, which diseases, he says, are reaching down into middle life and increasing there and apparently at all ages. Among 410,000 lives annually destroyed by these old age diseases, 60,000 occur under the age of 40; 105,000 between the ages of 40 and 60, and 245,000 above the age of 60. It is believed that virtually all of these deaths belong in the group above 60, and fully 80 per cent. of the deaths could be postponed for varying periods up to several years if these diseases were discovered in their incipiency and properly cared for. Rittenhouse says that these slowly developing afflictions are not only reducing the working, productive period of life, but also lower the capacity of the individual. They are responsible for accidents, damaged machines, spoiled goods and other costly errors. They are the concealed enemies of accuracy and efficiency. The records show that in thirty years the mortality from these diseases has nearly doubled. In a group of over 5,000,000 men and boy workers, increases in the death rate were noted as follows: apoplexy and nervous system, 19 per cent.; heart, 29 per cent.; kidney and urinary system, 43 per cent.; liver and digestive system, 34 per cent. It is said that the same story of the declining power of the American people to resist diseases of the vital organs is told by the statistics of the general population. Mortality from the important communicable diseases such as typhoid and tuberculosis has declined.

Housing and Labor Camps in California

The California Commission on Housing and Immigration, in its first annual report on the labor camps of that state, says that it soon found that a state-wide cleanup was necessary, and an inspection of the camps was instituted. In order that its efforts at cleaning up might not be entirely theoretical, it took over one of the camps, and under the direction of its sanitary engineer installed the necessary sanitary improvements. A set of rules and regulations based on this work was formulated and published with the approval of the State Board of Health and circulated among the employers of the state. Inspection of 876 camps showed 297, housing 21,577 persons, as "good," 316 camps with 22,382 occupants as "fairly good," and 263 camps housing 16,854 persons as "bad." The gravest evils lay in the absence or inadequacy of bathing facilities, toilets and garbage disposal. These inspections were made in 1914, and up to Jan. 1, 1915, 228 camps had been reinspected. These showed improvement in 72.3 per cent. up to the minimum standard established by the commission. Persuasion is now the only method of inducing employers to comply with the regulations, but the commission recommends that the legislature grant power to compel the establishment of sanitary standards. The commission also made inspections in the tenement districts, particularly in San Francisco, but also in other cities of the state, and found much room for improvement, with very little being done by local authorities in this direction. Los Angeles and San Diego being exceptions in this respect. The work of the commission stirred things up in many towns, and measures for improvement are pending in a number of places.

Tuberculosis and Its Prevention

Tuberculosis was responsible for 143,000 deaths in the United States during 1913, indicating the presence of 1,430,000 cases, as set forth in the address of Dr. George M. Kober, president of the National Association for the Study and Prevention of Tuberculosis, at the Seattle meeting. This large number of deaths occurred notwithstanding that the death rate has fallen from 326 per hundred thousand of population in 1880 to 147.6 in 1913. In the way of prevention, Kober recommends that inasmuch as 6 or 7 per cent. of average market milk contains tubercle bacilli, all milk unless derived from tuberculin-tested animals should be pasteurized or scalded. The renting of houses unfit for human habitation should be prohibited. As nearly half the deaths from tuberculosis occur among industrial workers, who constitute about one third of the population, dust and fumes, the foes of industrial life, should be banished, and proper environment in childhood should be provided. Among the special measures recommended are compulsory notification, enforcement of antispitting laws, prohibition of common drinking cups, proper sanitation of hotels, lodging houses, theaters, churches, schools, ambulances and trains, the prohibition of the marriage of tuberculous persons and isolation of tuberculous patients.

Founding of the American Hospital at Neuilly

In the London *Times'* history of the war, Part 41, June 1, 1915, is an interesting account of the founding of the American Hospital in the Lycée Pasteur at Neuilly, France, through the leadership of then American Ambassador Herrick, assisted by many American men and women, which the *Times* characterizes as one of the romances of hospital work. An uncompleted school building was placed by the French government in the charge of the Americans, who lost no time in transforming it into a perfectly equipped hospital. It is said: "The American committee took the Lycée Pasteur in hand without a moment's delay. Windows were fitted to empty frames, doors adjusted, the dust-covered floors were swept clean and the walls whitewashed; electric light and baths were installed, and immense class rooms partitioned off to form snug wards; a beautifully equipped operating theater, an anesthetic room, a sterilizing room, an x-ray department and a dental clinic were provided." It is further said that the organization of the hospital was remarkable, and was taken as the plan on which all the great war hospitals were afterward conducted, and that "the Americans led the way in the great new movement toward the perfect military hospital which the war initiated." After the hospital was opened, the need of better transportation between the battlefields and the hospital than that afforded by the railways, which were overcrowded and congested with traffic of all sorts, was seen, and a motor ambulance service was inaugurated. The battlefields at that time were not far from Paris, and with the aid of a dozen Ford cars which had been presented to the hospital, ambulances were rigged up from the packing cases in which the cars came and pressed into service. They accommodated two men lying and four sitting, and were able to climb steep grades, fulfilling the requirements of ambulance service away from main roads. The effect of baths and clean clothes and good attention were at once apparent on the self-confidence of the men brought in. The wards of the hospital were bright and cheerful, and the application of the best methods and equipment, including dental work for men needing it, and plastic surgery in severe wounds of the face, produced remarkable results. All manner of patients and all the nationalities engaged in the war were found in the hospital.

A Test of Clean Milk Production

Under the direction of North (*Am. Jour. Pub. Health*, June, 1915), a comparative test of clean milk production was made under the following conditions: Ten dairymen known by their low bacteria records to be expert clean milk producers were placed on ten dairy farms in the neighborhood of Philadelphia which were ordinarily equipped and which had only fair records under the owning dairymen. The experts were given sterile cans and sterile covered buckets with 5-inch openings. Under the conditions of the test they were to milk the cows on the respective farms once, and handle the milk until it was placed either in ordinary tanks of cold water or in ice water for cooling purposes; then, when the milk was transported to the milk stations, bacterial counts were to be made. The result of the best was that, whereas the owning dairymen of the ten dairies had bacterial counts on April 5 of 60,000 as a minimum to 4,830,000, the visiting experts April 6 produced milk which had counts ranging from 800 to 7,000, with a maximum in one instance of 61,000, in which the expert complained that the barn had been swept just before he milked, raising much dust. North concludes that the fundamentals of clean milk production, which were present in this test, are: milking with dry hands into covered milk pails; proper washing and sterilization of milking pails and milk cans; cooling milk by placing cans in tanks of cold water or ice water, and regular laboratory tests of milk for bacteria and payment based on laboratory tests. The last is the essential stimulus to clean milk production. North says he has revised his opinion in regard to the relative values of equipment and dairyman, so that the dairyman should count for at least 90 per cent. and equipment for the other 10 per cent. in clean milk production.

Medicolegal

Requirements in Investigations as to Insanity

(People vs. Hall (Mich.), 151 N. W. R. 687)

The Supreme Court of Michigan finds error in the proceedings in this case under Section 19 of Act 238 of the Public Acts of 1905. This provides, among other things, that, if any person in confinement under indictment for the crime of murder, etc., shall appear to be insane, the judge of the Circuit Court shall call two or more reputable physicians and other credible witnesses, and the prosecuting attorney to aid in the examination. The court says that the physicians called to aid in the investigation in this case did not appear by the record to have been sworn. Moreover, nowhere in the statute does it appear that a report or certificate of the physicians must be filed. But it seems clear to the court that it was the intent of the statute to compel the physicians called by the court to be sworn, and that their examination should be made a part of the record in the case on which the court should or might base a conclusion as to the fact of the sanity or insanity of the accused. While that portion of Section 19 referring to this subject does not in terms require the physicians to be sworn, the court is of the opinion that such must have been the intention of the legislature. The court is empowered to call two or more reputable physicians and other credible witnesses. This indicates that the legislature intended that the physicians as well as the other credible witnesses should be sworn. Furthermore, the court holds without force the argument that neither the evidence nor the report showed the accused to be insane, dangerous or criminal. By the terms of the statute, the inquiry is had for the purpose of ascertaining "whether his insanity in any degree continues." It seems to the court clear that such insanity might continue in some degree and in such a degree as to warrant the restraint of the accused for the time being and until secured, even though he was not violent or apparently dangerous. The report itself, however, recited "that at this time he has not sufficient self-control to resist violent impulses." If this statement were properly in evidence, it would be adequate, under the statute, to warrant the action of the court.

No Malpractice Shown in Treatment of Fracture and Occurrence of Infection

(Lorenz vs. Booth (Wash.), 147 Pac. R. 31)

The Supreme Court of Washington affirms a judgment rendered for the defendant after a motion, at the close of the evidence introduced on behalf of the plaintiff, to withdraw the case from the jury and render judgment in favor of the defendant, on the ground that the evidence introduced in the plaintiff's behalf was insufficient to call for the submission of the case to the jury. The court says that the plaintiff had sustained a simple fracture of the tibia about 4 inches above the ankle. The defendant advised, and used, what was called the Lane method of treatment, consisting of opening the flesh and inserting and attaching to the broken portions of the bone a plate so as to hold them rigidly in apposition and alignment. The operation was performed at a hospital, where the plaintiff remained six days, after which he was taken home, when the defendant cut a hole in the cast so as to render the flesh wound accessible for treatment, and then it was first discovered that the injured parts had become seriously infected. Counsel for the plaintiff proceeded on the theory that the defendant was negligent in treating the broken bone by the adoption of the so-called Lane method, which required the opening of the flesh to the bone in order to attach the plate thereto, and that he was thereafter negligent in using unsterilized water and the vessel in which it was used to cleanse the injured parts when treating them. But the most that could be said of the testimony in support of the contention that the defendant was negligent in adopting the Lane method was that such method did not have, at that

time, the unanimous approval of the medical profession. However, according to the only evidence presented in the plaintiff's behalf, that method did have the approval of at least a respectable minority of the medical profession, who recognized it as a proper method of treatment. This was enough to absolve the defendant from negligence so far as his mere use of that method was concerned, there being no showing that he exercised other than his best judgment in choosing that method. This court has heretofore recognized the rule that if there be more than one recognized method applicable to a particular case, the attending physician is not liable for an honest mistake of judgment in his selection of the method of treatment. Nor was there the slightest evidence but that every precaution known to medical science was exercised at the hospital looking to the prevention of infection. Yet the infection was discovered and had become serious at the end of that period. Up to that time there was nothing whatever pointing to negligence on the part of the defendant, unless the mere fact that infection had taken place was to be regarded as proof of his negligence, in other words, a bad result. But a mere "bad result" is not of itself ordinarily sufficient to render an attending physician liable for negligence; that is, it is not ordinarily of itself proof of such physician's negligence. Subsequent operations performed solely for the purpose of treating the infection were no evidence of improper treatment in the beginning. Neither was the defendant shown to have been negligent in the use, after the infection was discovered, of water and basin claimed to have been improperly used for want of sterilization. The vessel was a common wash basin, which was cleansed with warm water and soap by the plaintiff's wife before use, and when the water was put into it the defendant would put into the water some kind of antiseptic tablets, the exact nature of which was not shown, and which method of sterilization was not shown to be insufficient or such as a prudent physician would not use. To have allowed this cause to be submitted to the jury would have been merely to permit it to speculate on the question of the defendant's negligence.

Senile Dementia Is Insanity

(Andrus et al. vs. Andrus (La.), 67 So. R. 895)

The Supreme Court of Louisiana says that it was urged with great earnestness in this case that senile dementia is not insanity. But the various authorities on medical jurisprudence define "senile dementia" as one of the forms of insanity. It is characterized by a mental weakness and inability to reason, a state of enfeeblement of the brain, which comes to those whose other vital organs have served them to a very old age. It may be regarded as a venerable form of insanity, but it is insanity, nevertheless.

Unjustified Requests for Examinations by Physicians

(Wheeler vs. Chicago & W. I. R. Co. et al. (Ill.), 108 N. E. R. 330)

The Supreme Court of Illinois, in affirming a judgment in favor of the plaintiff for personal injuries, says that it was insisted that the trial court erred in refusing to allow the defendants' physicians to examine the plaintiff's leg in the presence of the jury. The argument was that, since the plaintiff exhibited the injured member to the jury, the defendants' physicians had a right to make a physical examination of the leg then, the same as they would have to examine any other exhibit in the case. But it did not appear from the record that any examination of the plaintiff's leg was made in the presence of the jury, other than the mere exhibiting of it to the jury. The Supreme Court does not think that the mere showing of the injured member to the jury gave the defendants the right to invade the privacy of the plaintiff's person and make him submit to an extended scientific examination in the presence of the jury. Again, when the defendants requested the right to have the plaintiff examined by their experts, the plaintiff offered to submit to an examination by the same physician of defendants who had previously examined and treated him for his injury. It appeared from the evidence that the first physician he consulted after the injury was the defendants' physician, and that he was treated by him and one of his assistants for some time after the injury, and that the injury was diagnosed by this physician as a transverse fracture of the knee cap, and the injured member was treated by the physician and his assistants for such injury. The Supreme Court thinks that the offer made was fair, and that the trial court did not err in refusing to require the plaintiff to submit to a further examination by other physicians to be selected by the defendants.

Society Proceedings

COMING MEETINGS

Amer. Assn. of Obstetricians and Gynecologists, Pittsburgh, Sept. 14-15.
American Electro-Therapeutic Association, Atlantic City, Sept. 14-16.
American Public Health Association, Rochester, N. Y., Sept. 7-10.
Association of Military Surgeons of the U. S., Washington, Sept. 13-15.
Indiana State Medical Association, Indianapolis, Sept. 23-24.
Kentucky State Medical Association, Louisville, Sept. 21-23.
Michigan State Medical Society, Grand Rapids, Sept. 1-2.
Missouri Valley Medical Society, Des Moines, Sept. 23-24.
New Mexico Medical Society, E. Las Vegas, Sept. 6-8.
Oregon State Medical Association, Portland, Sept. 9-10.
Pennsylvania State Medical Society, Philadelphia, Sept. 20-23.
Utah State Medical Association, Salt Lake City, Sept. 28-29.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

Archives of Ophthalmology, New Rochelle, N. Y.

July, XLIV, No. 4, pp. 369-479

1 Study of Bitemporal Hemianopsia with New Instruments and Methods for Detecting Slight Changes. C. B. Walker, Boston.
2 Keratitis Caused by Infection with Bacillus Coli. A. C. Macleish, Los Angeles.
3 Double Chancre of Eyelid. C. E. Finlay, Havana, Cuba.
4 Form and Color Test Object for Perimetric Work. L. C. Peter, Philadelphia.
5 Congenital Division of Optic Nerve at Base of Skull. C. M. Snead, Jefferson City, Miss.
6 Pathology and Treatment of Certain Diseases of Internal Secretion. S. J. A. Schoenborn, Heidelberg.
7 Clinical and Experimental Investigations on Etiology of Heterochromia. J. Bistis, Athens, Greece.
8 Conservation of Vision. G. S. Derby and H. C. Greene, Boston.

Archives of Pediatrics, New York

June, XXXII, No. 6, pp. 401-486

9 Boston as Pediatric Center. J. L. Morse, Boston.
10 *Homogenized Olive Oil and Fat-Free Milk Mixtures in Case of Difficult Feeding. M. Ladd, Boston.
11 Pyloric Stenosis and Pyloric Spasm; Report of Three Cases. C. H. Munn and W. W. Howell, Boston.
12 *Clinical and Pathologic Study of One Hundred Infants. R. M. Smith and S. Cobb, Boston.
13 Energy Metabolism of Infant with Congenital Absence of Cerebral Hemispheres. F. B. Talbot, Boston.
14 *Relation of Gas Bacillus to Infectious Diarrhea and Other Digestive Disturbances in Childhood. P. H. Sylvester and F. H. Hibben, Boston.
15 Some Measurements of Normal Children, Especially of Leg and Arm. J. I. Grover, Boston.

10. **Homogenized Olive Oil and Fat-Free Milk.**—In general, the results obtained by Ladd in the use of homogenized olive oil as a substitute for cow's fat in cases of difficult feeding have been such as to warrant the hope that it will prove a safe and valuable means of administering fat in the so-called cases of "fat intolerance." Ladd states that its use will not, however, relieve the physician of the necessity of intelligent application of the principles of modification and adaptation of the food to the individual requirements of the infant.

12. **Clinical and Pathologic Study of Infants.**—The skin tuberculin test was applied by Smith and Cobb to 23 patients coming to necropsy. The result of the test was as follows: Negative, 21; positive, 2. One of the positive cases gave a negative test ten days later, the other gave only a slight reaction, and at necropsy there was lobar pneumonia without any tuberculosis. Nine cases in the series of 100 showed tuberculous lesions at necropsy; 4 of these were extensive miliary processes, 2 were tuberculous peritonitis, 1 was tuberculous peritonitis and tuberculosis of the lungs, 1 was tuberculosis of the lungs and 1 was tuberculosis of the peribronchial lymph nodes. A clinical diagnosis of tuberculosis was made in 6 of these cases, indigestion in 2 and bronchopneumonia in 1. The von Pirquet test was applied in 8 of these cases and was negative in all except 1, which showed a positive reaction on the first test and a negative reaction ten days later. Only 1 of the 9 patients gave a history of exposure to tuberculous infection. The duration of the acute symptoms did not exceed two weeks in any instance.

Examination of the lymph nodes was made in 93 cases and comparison made with the clinical histories. It was found that over one half, or 54 per cent., of the cases showing acute gastro-intestinal disease showed an enlargement of the mesentery lymph nodes. This raises the question whether or not in many children who have difficulty in the digestion of fat during convalescence from these diseases, the problem may be physical as well as physiologic because of an obstruction to the lacteals in the mesentery by the enlarged glands. Forty patients in the whole series had enlarged glands and 27 of these, or 67.5 per cent., were in acute diseases, 5 in tuberculosis, 6 in chronic diseases, 2 unclassified. Fifty-three patients showed no enlargement; 20 were in acute and 33 in chronic diseases. Microscopic examination of lymph nodes from 32 cases showed that there is atrophy of the germinal centers with increase in size of the nodes and that this atrophy occurs in acute diseases more often than in chronic; 84 per cent. of the acute cases had atrophy of the germinal centers, and only 50 per cent. of the chronic. It was found that 80 per cent. of the nodes measuring over 6 mm. in diameter, but only 25 per cent. of those measuring 5 mm. or less, showed atrophy; probably, therefore, any mesenteric node measuring more than half a centimeter in diameter is, to some extent, pathologic.

14. **Relation of Gas Bacillus to Diarrhea.**—From experience in the study and treatment of these cases Sylvester and Hibben have come to observe the following routine: (1) To give unpasteurized lactic-acid milk exclusively until the stools are gas bacillus-free for 3 successive plants at two or three-day intervals. (2) When gas bacillus-free, (*a*) continue a small amount of lactic-acid milk daily; (*b*) gradually increase the amount of food to normal caloric requirements by adding skim milk and, cautiously, small amounts of carbohydrates, preferably in the form of maltose and very well-cooked starches, testing for gas from time to time. (3) Add fat to the diet after weeks or months, in very small amounts, watching stools frequently for undigested fat. (4) When there is a recurrence of the gas bacillus, treatment should be repeated.

This treatment was used in cases in which the gas bacillus was present, as follows: Infectious diarrhea, 31 cases, in which 2 patients died (were moribund on admission); 29 were clinically well within five days. Of the 9 not so treated none got well within weeks, and 3, after weeks of "old routine" treatment, were given the foregoing treatment and got well in four days. In the 4 cases of mixed infections none of the patients really improved. In cases of fat intolerance 20 patients were so treated and rapidly became free from symptoms of disturbed metabolism; 9 not so treated showed persistent evidence of disturbed metabolism. In the cases of carbohydrate intolerance all patients showed marked improvement in stools. There were none who did not receive the above treatment. In the 15 cases of chronic intestinal indigestion 11 patients were so treated and immediately improved, although recurrence took place in most of them, to be immediately relieved by the return to the fat-free lactic-acid milk. Of the 4 not so treated the conditions in all persisted for months.

Fat-free diet has been adhered to in all of these cases, because, as has been shown so many times hitherto, the digestion of fat is disturbed for considerable periods following all cases of infectious diarrhea. In the cases in which the patients were doing well on unpasteurized fat-free lactic-acid milk, 5 patients received, for a short time, pasteurized fat-free lactic-acid milk. In each of these cases improvement immediately abated, although none of the patients had an actual recurrence. On returning to the unpasteurized lactic-acid milk improvement was again rapid.

Boston Medical and Surgical Journal

July 22, CLXXIII, No. 4, pp. 113-150

16 Alcoholism. E. B. Emerson, Bridgewater.
17 Cerebrospinal Fluid in Diagnosis and Treatment. W. H. Watters, Boston.
18 Results of Treatment of Pyorrhea Alveolaris and Allied Conditions with Emetin Hydrochlorid at Danvers State Hospital. H. I. Gosline, Danvers.

Colorado Medicine, Denver

July, XII, No. 7, pp. 171-212

19 Medical Aspects of Cancer. C. N. Meader, Denver.
20 Cancer Prophylaxis. C. F. Hegner, Denver.
21 Cancer in Women. H. G. Wetherill, Denver.
22 Cancer of Skin. A. J. Markley, Denver.
23 Diagnosis and Treatment of Papillary or Villous Tumors of Bladder. W. M. Spitzer, Denver.
24 Use of Pituitary Extract in Obstetrics. C. B. Ingraham and P. M. Chase, Denver.
25 *Blood Pressure Control of Exercise in Tuberculous. L. S. Peters, Albuquerque, N. M.
26 Case of Typhoid Spine. H. W. Wilcox, Denver.
27 Tendon Transplantation Following Infantile Paralysis. C. G. McEachern, Denver.
28 Symptoms of Dyspepsia Associated with Surgical Lesions. C. E. Tennant, Denver.
29 Social Service Work in Relation to Dispensary. M. R. Stratton, Denver.

25. **Blood Pressure Control of Exercise in Tuberculous.**—A class of six men was selected by Peters three being excellent cases both pulmonarily and physically; two fairly arrested far advanced cases; and one rather new recruit with normal temperature but physically inferior. All were started with a fifteen-minute walk each day. The pressures on starting of the three able-bodied men were 138, 132 and 148. On their return the pressures were 138, 144 and 152. After an hour's rest the readings were 138, 142 and 158, showing apparently no ill effects from the exercise. In the two fairly well-arrested far-advanced cases the men started with pressures of 164 and 124, returning with 146 and 130, and after resting, 164 and 118. The first man was not used to exercise in any form, as is shown by a drop of 18 mm. of mercury with a return to the original after an hour's rest. The overexertion in the second man is evident, for we find after resting that there is a drop of 6 mm. from the original reading recorded, and of 12 mm. from the reading recorded on the return. The new recruit started with 146, returned with 138, and after rest his reading was 127. The overexertion in this instance is well illustrated from the pressure findings, and was further substantiated by marked fatigue, breathlessness and rapid heart action. Whenever a patient shows a drop of 6 or more mm. after rest or a marked drop on returning, even though this disappears after rest, Peters decreases the exercise. If there is a slight drop after returning he repeats the exercise the following day or until an even standard is maintained, when the exercise is again increased. It is interesting to note that in many of the better class of patients, from a physical standpoint, the pressures remain practically the same even up to walks of four hours a day or longer.

Florida Medical Association Journal, St. Augustine

July, II, No. 1, pp. 1-32

30 Cancer of Prostate. R. C. Turck, Jacksonville.
31 Cancer Problem. J. K. Simpson, Jacksonville.
32 Organization of National and Local Forces in Campaign Against Cancer. C. E. Lakeman, New York.

33 Cancer of Stomach; Its Diagnosis. J. E. Boyd, Jacksonville.
34 What Dentist Can Do to Lessen Occurrence of Cancer of Face, Lips, Tongue and Oral Cavity. J. L. Kirby-Smith, Jacksonville.
35 Cancer Problem. C. Hutchinson, Pensacola.
36 Carcinoma of Uterus. T. S. Field, Jacksonville.

Georgia Medical Association Journal, Augusta

July, V, No. 3, pp. 49-80

37 Surgical Treatment of Goiter. E. G. Jones, Atlanta.
38 Pre-Pellagrous Digestive and Nervous Disorders. R. Blosser, Atlanta.

Journal of Biological Chemistry, Baltimore

July, XXI, No. 3, pp. 511-677

39 *Study of Amino-Acid Content of Blood. P. György and E. Zunz, Brussels.
40 *Some New Constituents of Milk; Phosphatides. T. B. Osborne and A. J. Wakeman, New Haven, Conn.
41 *Rapid Method for Determining Calcium in Urine and Feces. H. Lyman, Boston.
42 *Function of Liver in Urea Formation from Amino-Acids. B. C. P. Jansen, Amsterdam.
43 Preparation of Sarcosin. L. Baumann, Iowa City, Ia.
44 Quantitative Determination of Creatin in Muscle and Other Organs. N. W. Janney and N. R. Blatherwick, New York.
45 Metabolism of Creatin and Creatinin. Relationship Between Creatin and Creatinin in Autolyzing Tissue. V. C. Myers and M. S. Fine, New York.
46 Distribution of Cyanogen in Grasses, Especially in Genera Panicularia or Glyceria and Tridens or Sieglingia. C. L. Alsberg and O. F. Black, Washington, D. C.
47 *Amino-Acid Content of Certain Commercial Feedingstuffs and Other Sources of Protein. E. H. Nollau, Lexington, Ky.
48 Influence of Composition and Amount of Mineral Content of Ration on Growth and Reproduction. E. V. McCollum and M. Davis, Madison, Wis.
49 Blackening of Leaves of Wild Indigo (Baptisia Tinctoria) and Isolation of New Phenol, Baptisol. E. D. Clark, New York.
50 Presence of Cholin in Shoots of Aralia Cordata. K. Miyake, Japan.
51 *Creatinuria. A. E. Taylor, Philadelphia.

39. Amino-Acid Content of Blood.—György and Zunz found that copious bleeding brings on an increase in the amino-nitrogen content of the blood. If, at the same time as the bleeding, an intravenous injection of Ringer's solution is given, the amino-nitrogen content of the blood tends, on the contrary, in the majority of cases to diminish. The amino-nitrogen content of the blood does not change during the process of digestion of a meal poor in proteins (purée of potatoes). During the digestion of a meal rich in proteins (raw beef), we observe, in agreement with the authors mentioned above, a marked increase in the amino-acid content of the blood. This increase is more marked in the corpuscles than in the plasma. During digestion of a meal rich in proteins, the content of venous blood in amino-nitrogen is lower than that of arterial blood.

40. Some New Constituents of Milk.—Osborne and Wakeman suggest that it is probable that these phosphatids are not combined with the lactalbumin which is the chief constituent of the coagulum, but with another protein, for the authors have found that when the filtrate from the casein is neutralized with milk of lime the acidified filtrate from the precipitate yields a coagulum which is free from phosphorus. Since the precipitate produced by this neutralization contains protein it is probable that the phosphatids are also contained therein as a lecithalbumin containing a relatively large proportion of phosphatid similar to ovovitellin of the egg yolk.

41. Calcium in Urine and Feces.—There are three main steps in Lyman's method: (1) isolation of the calcium as calcium oxalate; (2) solution of the calcium oxalate in dilute acid; (3) precipitation of the calcium as soap, and comparison of the cloud so formed with the cloud of a standard solution by the Duboscq colorimeter. The method of procedure is described in detail.

42. Function of the Liver in Urea Formation.—It appears from Jansen's experiments that the liver can play an important part in the formation of urea from amino-acids.

47. Amino-Acid Content of Feedingstuffs.—An examination of the results given by Nollau shows many marked individual peculiarities of the different mixed proteins. Among such peculiarities may be mentioned the absence of histidin in distillers' dried grains and in the cowpea; the absence of nonamino-nitrogen, representing prolin and oxyprolin, in wheat bran and the maize kernel. The relatively large amount of lysin present in the soy bean, distillers' dried grains, wheat bran, dried blood, maize kernel, hemp seed and sunflower seed is especially noteworthy. In contrast to this is an absence of lysin in rice, oat grain, rolled oats and barley grain. The mono-amino-acids constitute, in most cases, about one half of the amino-acids present. The high ammonia content and the low lysin content of gluten (wheat) and gluten flour is marked. Similar results have been obtained in the analysis of gliadin by Van Slyke. The high arginin content of the peanut, black walnut and hickory nut as compared with the relatively small amount of arginin in the pecan is noteworthy. The reverse of this is found in the histidin content of these nuts.

51. Creatinuria.—The data given Taylor indicate that the presence of creatin in the urine of children cannot be regarded as related to deficiency of carbohydrate in the diet, as has been suggested; they also indicate that the finding of creatin in the urine cannot be ascribed to a methodic error, as has been suggested, due to the interference in the color reaction of the Folin method by acetone or acetonetic acid. The subjects of Taylor's report were two little girls of 10 and 4 years of age. They were not normal children, but this fact does not invalidate the conclusions to be drawn from the data. The elder child was the subject of hypopituitarism, the result of a tumor of unknown nature in the hypophysis. The younger child suffered from recurrent vomiting. The observations to be described were obtained in the period between attacks, when the child appeared entirely well. Both children were under strict observation of trained nurses, and there was every reason to believe that the instructions for feeding and collection of excrements were carried out substantially as ordered. Both children were under metabolic tests, and the figures for creatin and creatinin are parts of the metabolic data.

The figures for the urinary ketones in the first child are entirely normal; in the second child they are very low, due apparently to high carbohydrate and low fat intake. In each instance the intake of carbohydrate must be termed generous, even high, in relation to the total caloric intake. The constant creatinuria observed could not have been due to deficiency in carbohydrate intake. The amounts of ketones found in the urine were normal in the one child, very low in the second child. About half of the ketone was present as beta-oxybutyric acid. The highest relative findings for creatin were in the urine of the second child, which contained ketones in such mere traces that half the urine had to be distilled to make the estimations.

Journal of Cutaneous Diseases, New York

July, XXXIII, No. 7, pp. 509-554

52 Histopathology of Some of Secondary Skin Eruptions of Syphilis. C. C. Dennie, Boston.
53 Benign Forms of Tuberculosis of Skin. G. M. Olson, Minneapolis.
54 Tertiary Luetic Keratoderma. P. H. Ealer, Philadelphia.
55 Résumé of Two Hundred Cases of Hypertrichosis Treated with Roentgen Ray. A. C. Geyser, New York.
56 Physical Diagnosis in Dermatology. D. L. Satenstein, New York.

Journal of Medical Research, Boston

July, XXXII, No. 3, pp. 309-537

57 Studies in Diphtheroids. Nature and Clinical Importance of Pseudodiphtheria Bacilli. H. Fox, Philadelphia.
58 Id. Source of Pseudodiphtheria Forms in Body. Experiments on Mutation. H. Fox, Philadelphia.
59 *Tumors of Japanese Waltzing Mouse and of Its Hybrids. E. E. Tyzzer, Boston.
60 *Tumors of Parathyroids. F. Harbitz, Christiana, Norway.
61 Splitting of Elastic Fibers in Arteries. J. W. McMeans, Pittsburgh.
62 Preservation of Reagents Used in Wassermann Reaction. P. G. Weston, Warren, Pa.
63 Isolation, Identification and Serum Reactions of Typhoid and Paratyphoid Bacilli. G. H. Robinson, Providence, R. I.
64 *Spontaneous Rupture of Kidneys, with Secondary Perirenal Hemorrhage, in Acute Toxic Nephritis. H. W. Wade, Tulane, La.
65 *Pyrogenic Action of Bacillus Typhosus. D. H. Bergey, Philadelphia.

66 *Study of Effect of Anaphylaxis and Leech Extract on Coagulation of Blood. R. I. Lee and B. Vincent, Boston.

67 *Anatomic and Histologic Expression of Increased Resistance Toward Tuberculosis in Cattle Following Intravenous Injection of Human and Attenuated Bovine Tubercle Bacilli. T. Smith, Boston.

68 Comparative Pathology of Tracheal and Bronchial Lesions Produced in Man by B. Pertussis (Whooping Cough) and Those Produced in Dogs by B. Bronchisepticus (Canine Distemper). L. J. Rhea, Montreal, Canada.

69 *Cell Enzymes and Energesis in Relation to Cancer. L. D. Bristol, University, N. D.

70 Neurocytology of Surgical Shock. D. W. B. Kurtz, Jr., St. Louis.

71 Thyroid and Circulatory Changes Following Experimental Ligation of Thyroid Vessels. H. Neuhof, New York.

72 Cutaneous Infection Caused by Few Fungus, Phialophora Verrucosa, with Study of Fungus. E. M. Medlar, Boston.

73 Vaccination of Cattle Against Tuberculosis. Occasional Persistence of Human Type of Tubercle Bacillus in Cattle. T. Smith and M. Fabyan, Boston.

59. Tumors of Japanese Waltzing Mouse.—A carcinoma J. w. A has been propagated by Tyzzer through forty-seven transfers during a period of eight years. The analysis of the results in the first forty-three transfers shows, in 753 Japanese waltzing mice inoculated, only 16 failures, or approximately 2 per cent. This tumor has invariably failed to grow in common mice. Tumors have developed in 83 of the 89 hybrids of the first filial generation inoculated and reinoculation of three of the failures produced a tumor in one, so that approximately 5 per cent. are to be regarded as nonsusceptible. Since reporting the negative results in 62 hybrids of the second and 16 hybrids of the third filial generation, 6 additional F hybrids have been inoculated with negative result. The inoculation of a heterogeneous group of 33 hybrid mice obtained by the promiscuous breeding of the second filial and subsequent generations resulted in the growth of the tumor in a single mouse recorded as belonging to the second filial generation. This tumor grew on transplantation in Japanese waltzing mice in 2 out of 4 F hybrids, failed to grow in 8 F hybrids and on transplanting again also failed in 3 F hybrids. This result is suggestive in that it indicates that an occasional mouse may be found susceptible in other than the first generation, if sufficient numbers of animals are tested. In its further growth on transplantation in other F hybrids, the factor of adaptation through previous growth in such a hybrid should be taken into account.

Apart from the appearance of a mixed tumor in the first transfer, Tumor J. w. A has maintained throughout propagation a uniform histologic character. Variations in rate and mode of growth have been noted, however. This tumor (J. w. A) shows a high incidence of metastases, these having occurred in 28.9 per cent. of all mice which have lived more than thirty days after inoculation. The earliest visible metastases were observed thirty days after inoculation. Filtration, centrifugalization, and drying of this tumor have each failed to indicate the presence of a causative agent apart from the living tumor cell. A second tumor (J. w. B), originating subcutaneously in the Japanese waltzing mouse and apparently of the nature of a sarcoma, has been propagated for nine transfers, during which it has grown in each of the 160 mice inoculated. No metastasis has occurred until recently, when secondary nodules have been found in the axillary lymph node and in the lung of a single animal. The intravenous injection of tumor J. w. B and its resulting growth in the lung has not served to immunize the animal against the same tumor subsequently implanted beneath the skin. Neither does the growth of this tumor interfere with the success of subsequent implants of Tumor J. w. A. The blood or serum of a rabbit immunized to this tumor is without curative action even when repeatedly injected into the tumor.

60. Tumors of Parathyroids.—Harbitz cites a case of paralysis agitans, when there happened to be present symmetrical tumors (adenomas) of the parathyroids, which, clinically, had caused no local disturbance. The question arises whether or not the tumors had any etiologic relation to the disease from which this man had suffered for many years.

64. Spontaneous Rupture of Kidneys.—Wade claims that spontaneous rupture of the kidney may occur in severe acute parenchymatous nephritis, due solely to the extent and rapidity of the swelling of the organ. It is a condition of extreme rarity and the case presented is, so far as can be determined, the second to be recorded in which bilateral rupture of this type was found. Such rupture apparently may occur with or without perirenal hemorrhage of sufficient degree to present symptoms. When due solely to the rapid swelling of the parenchyma and edema of the interstitial tissue, compression of the cortical capillaries may prevent extensive hemorrhage. The fatal acute nephritis in the case presented by Wade was probably due to the combined circumstances of antisyphilitic treatment given a patient with active syphilis, chronic malaria and an acute parenchymatous nephritis. Microscopically many of the parenchymal cells present an unusual extensive accumulation of "colloid" globules the nature of which is not thoroughly understood, though they probably are degeneration products and related to bodies found in other degenerative conditions.

65. Pyrogenic Action of Bacillus Typhosus.—It was claimed by Bergey that a large part of the pyrogenic action of *Bacillus typhosus* is due to an intracellular poison, and only a slight effect, if any, is due to a soluble toxin. The serum of animals immunized against culture filtrates of *B. typhosus* and against dead bacilli exerts a slight antipyrogenic action. There is not sufficient evidence, in the results obtained by the protective use of the serum of immunized animals, to suggest that similar serums would have much influence as therapeutic agents.

66. Study of Effect of Anaphylaxis.—Certain experimental evidence is introduced by Lee and Vincent tending to show the importance of the blood platelets in the coagulation of blood and also to show that, in two experimental conditions in which incoagulable bloods were obtained, the incoagulability depended, in a large part at least, on the disturbance of the function of the blood platelets.

67. Resistance Toward Tuberculosis in Cattle.—Smith found that the intravenous injection of tubercle bacilli of bovine type into calves, following preliminary injections of bacilli of human or attenuated bovine type, causes a heightened resistance which manifests itself by a shifting of the lesions from parenchyma of the lungs, namely, the alveolar walls, to the bronchioles serving lobules of portions thereof. The affected lobules are subpleural. The disease is chronic and progressive to a certain degree at least. It develops as a peribronchial inflammation in which lymphoid or round cells predominate. This may break through the wall of the bronchus, fill the lumen, cause collapse, aspiration of ingrowing cell masses with tubercle bacilli, and subsequent caseation of the collapsed territory. Veins and arteries in the immediate neighborhood of affected bronchioles are not invaded. The beginning of tuberculous changes in the wall of the minute bronchi is not in itself proof that the bacilli are air borne, nor does it prove that inhaled bacilli have penetrated directly the mucosa of the minute bronchi. Localization depends very materially on states of resistance of the host, or, what is equivalent, on the degree of virulence of the tubercle bacilli. The type of cell reaction is the same in the udder as in the lungs. Endothelioid and giant cells seem to be much more numerous in those cases whose acquired resistance is lowest. The development of tuberculosis in the apical lobes in man is best accounted for by the less active aeration and less active lymph current. Rib pressure may contribute toward fixing the bacilli. Bacilli, deposited either from the air or the blood in other lobes, are either destroyed or promptly carried by the lymph current to the lymph nodes in which they are gradually destroyed. The phenomenon of phthisis in man, in Smith's opinion, is strong evidence that the human being possesses a relatively high degree of resistance to the tubercle bacillus. This inference from comparative pathology has been abundantly proved in the past by necropsy records.

69. Cell Enzymes and Energesis.—From his study of the cancer problem Bristol has reached the conclusion that cancer

is the result of localized, unchecked overcombustion, or hyperoxidation, in epithelial cells.

Journal of Nervous and Mental Disease, Lancaster, Pa.

July, XLII, No. 7, pp. 465-528

74 Case of Pemphigus in Paretic. M. A. Bahr and F. C. Potter, Indianapolis.
75 *Experimental Subarachnoid Injections of Trypan Blue. W. C. Woolsey, New York.
76 Mental Disease and Language. W. McDonald, Jr., Providence, R.I.

75. **Subarachnoid Injections of Trypan Blue.**—Experimental observations by Woolsey seem to indicate that salvarsan administered subarachnoidally does reach the central nerve tissues more certainly and with greater intensity than when given intravascularly or subcutaneously. That when administered intraspinally its diffusion to the cranial cavity is less intense than in the cord and that perhaps for intracranial lesions direct injection into the cranial subarachnoid space through a trephine opening would be less dangerous and more effectual.

Journal of Parasitology, Urbana, Ill.

June, I, No. 4, pp. 159-207

77 Parasite of Oral Endamebiasis, Endameba Gingivalis (Gros). A. I. Smith and M. T. Barrett, Philadelphia.
78 Acanthocephala in North American Amphibia. H. J. Van Cleave, Chicago.
79 *Protection of Parasites in Digestive Tract Against Action of Digestive Enzymes. W. E. Burge and E. L. Burge, Chicago.
80 Parasites of American Muskrat (Fiber Zibethicus). F. D. Barker, Omaha.
81 Gordius Larvae Parasitic in Trematode. W. W. Cort, St. Paul.

79. **Protection of Parasites.**—The Burges assumed that the oxidative processes going on in the cells of the parasite exposed to the action of the trypsin oxidize the enzyme. Thus the parasite, like the mucosa of the tract itself, is protected from digestion. Experiments and observations made to determine if any evidence could be brought forward in support of this assumption showed that tapeworms and roundworms from the intestine of the dog are not digested when introduced into activated pancreatic juice so long as they remain alive, but are digested when dead. If any part of them be killed this part is digested. A dead roundworm which is ordinarily digested when introduced into activated pancreatic juice, can be prevented from being digested by keeping the dead body wall constantly permeated with nascent oxygen. The oxidative processes of the living parasites enable them to withstand the action of the digestive juices by oxidizing the enzyme solution immediately in contact with them.

Journal-Lancet, Minneapolis

July 1, XXXV, No. 13, pp. 339-364

82 Cancer Problem. W. J. Mayo, Rochester.
83 Cancer of Uterus, and Its Early Recognition. E. A. Weiss, Pittsburgh.
84 Treatment by Heat of Advanced Cancer of Cervix (Percy's Method). D. C. Balfour, Rochester.
85 Roentgen Rays in Diagnosis of Focal Infections. F. S. Bissell, Minneapolis.
86 Brief Resume of Recent Advances in Therapy of Lues. H. E. Michelson, Virginia.
87 Splenic Pathology of Pernicious Anemia and Allied Conditions; Duodenal Method of Estimating Hemolysis. J. P. Schneider, Minneapolis.

July 15, No. 14, pp. 365-397

88 Surgical Pathology of Prostate. E. S. Judd, Rochester.

Medical Record, New York

July 24, LXXXVIII, No. 4, pp. 131-172

89 Angina Pectoris. R. Stein, New York.
90 Study in Internal Therapeutics of Radium. S. Delano, Boston.
91 Operative Orthopedics as Illustrated by Hospital Service. R. Whitman, New York.
92 Public Health of Other Ages. H. D. King, New Orleans.
93 *Diagnostic Sign in Inflammatory Conditions and Traumatisms in and About Liver. M. R. Bookman, New York.
94 *Cases of Hypnotic Drug Poisoning. A. S. Tepper, Far Rockaway.
95 Arch Supporters for Fallen Arches. M. Strunsky, New York.

93. **Diagnostic Sign in Inflammatory Conditions In and About Liver.**—The round ligament of the liver is a natural tractor as evinced by an operation in the upper abdomen, and traction on this ligament causes some motion and displacement of the liver bulk, so that in the presence of any inflammatory or traumatic conditions in this region this will cause pain at the affected site. To elicit this sign Bookman says, the patient's shoulders should be elevated on pillows to relax the recti muscles, the examiner stands on the patient's right and facing him, the right index finger is hooked in the umbilicus, and with gentle traction forces the umbilicus downward in the direction of the pubis. Should the umbilicus be too shallow the finger may be reinforced by a damp cloth or a strip of adhesive plaster with the adhesive surface outward. The mechanism involved in this maneuver is to put the round ligament on the stretch, causing some traction on the liver and slightly rotating it downward and forward. This sign has proved positive in some cases of acute cholecystitis, cholelithiasis, abscesses of the liver associated with suppurative pylephlebitis, and in a case of traumatic laceration of the right coronary ligament. This sign is not claimed to be pathognomonic of any condition or conditions.

94. **Hypnotic Drug Poisoning.**—The first case cited by Tepper that of a child, 40 grains of veronal were taken at one dose, while in the second case, that of an adult, approximately 100 grains of monobromated camphor, in the course of twenty-four hours were taken. Both patients recovered.

Michigan State Medical Society Journal, Grand Rapids

July, XIV, No. 7, pp. 351-390

96 Prevention Methods. C. H. Johnson, Grand Rapids.
97 Early Diagnosis of Pulmonary Tuberculosis from Standpoint of General Practitioners. V. C. Vaughan, Jr., Detroit.
98 Why Tuberculosis in Childhood is Important. H. M. Rich, Detroit.
99 Tuberculosis of Kidneys. R. C. Stone, Battle Creek.
100 Workshop and Stores in Spread of Tuberculosis. J. T. Cooper, Muskegon.
101 Hygienic Treatment of Tuberculosis. J. D. Dunlop, Alpena.
102 Cancers of Skin. U. J. Wile, Ann Arbor.
103 Clinical Side of Carcinoma of Breast. C. B. G. de Nancrede, Ann Arbor.
104 How the State Can Help in Solving Cancer Problem. C. G. Darling, Ann Arbor.
105 Contribution of Roentgen Ray to Diagnosis of Abdominal Carcinoma. J. G. Van Zwaluwenburg, Ann Arbor.
106 Treatment of Cancer of Uterus. R. Peterson, Ann Arbor.
107 Cancer of Nose. R. B. Canfield, Ann Arbor.

Military Surgeon, Chicago

July, XXXVII, No. 1, pp. 1-106

108 Medical Corps in Peace and War. R. W. Wilcox, U. S. Army.
109 Model Field Hospital. R. C. Turck, Fla. N. G.
110 Relationship of Variola and Vaccinia. P. M. Ashburn, E. B. Vedder and E. R. Gentry, U. S. Army.
111 Paper Utensils in War Surgery. J. Frank, Ill. N. G.

New York Medical Journal

July 24, CII, No. 4, pp. 169-220

112 *Blood Pressure in General Practice. E. H. Goodman, Philadelphia.
113 Psychotherapy. (To be continued.) O. Lerch, New Orleans.
114 Treatment of Ethmoiditis. S. McCullagh, New York.
115 *Diastolic Blood Pressure. J. S. Ferguson, New York.
116 Michael Servetus' Book on Syrups. C. G. Cumston, Geneva, Switzerland.
117 Differential Diagnosis of Flatfoot. H. Finkelstein, New York.
118 Painful Heels Due to Exostosis of Os Calcis; Report of Cases. A. L. Waechter and H. D. Sonnenschein, New York.
119 Differentiation Between Functional and Organic Cardiac Disease in Children. M. H. Bass, New York.
120 Typhoid. C. P. Bolles, Wilmington, N. C.
121 State's Efforts to Protect Life in Infancy and Youth. L. A. De Vilbiss, New York.

112. **Blood Pressure in General Practice.**—Goodman urges that no physician should attempt the reduction of blood pressure without controlling at every step his medication by the sphygmomanometer. In the treatment of hypertension, an important fact must not be lost sight of, namely, that high blood pressure is often a necessary accompaniment of altered function and structure, and were it not for this raised blood pressure, life could not be carried on with these functional or organic changes. Cardiac strength and peripheral resistance are necessary for the maintenance of blood pressure at a certain level. This is true in health, and is true in disease, with this added feature, that hypertension, if permanent,

creates a new physiologic limit, not 130 and not 180, but perhaps 200. One can never say what this physiologic limit is for any given individual, but it must be determined, and below it blood pressure cannot be reduced with safety any more than can blood pressure in health be reduced below the normal physiologic limit. To reduce pressure below the new physiologic limit is not only not indicated, but is bad therapy, hence, when using cardiac depressor drugs or vasodilator methods, blood pressure must be constantly watched and repeated estimations made.

115. **Diastolic Blood Pressure.**—Ferguson urges the use of a method of reading the diastolic pressure as accurately as the systolic pressure. The proposed method essentially consists in recognizing as the proper diastolic reading the point at which the first sound is heard on returning from a point just below the fourth phase to that greater height of mercury at which the sounds reappear. Ferguson recommends the general use of the method, because of its simplicity, the relative ease with which facility in its practice is acquired, the relative accuracy of its diastolic readings, the clear demarcation of the point to be read, the close proximity of its readings to the accepted indication of the true diastolic pressure, and the fact that with its routine use, low diastolic pressures and especially the signs of aortic disease can scarcely be overlooked, even by the novice in blood pressure work.

New York State Journal of Medicine

July, XV, No. 7, pp. 251-288

122 Prophylactic Treatment and Early Diagnosis of Cancer of Uterus. J. A. McGlinn, Philadelphia.
123 Technic of Applying Heat in Treatment of Inoperable Uterine Carcinoma. J. F. Percy, Galesburg, Ill.
124 Diagnosis of Colon Cancer. J. Burke, Buffalo.
125 Suggestion for Preserving Sphincter Control in Operating for Cancer of Rectum. E. R. McGuire, Buffalo.
126 Operation for Cancer of Breast; Lantern Slide Demonstration. P. Syms, New York.
127 *Cancer of Bladder. J. B. Squier, New York.
128 *Basal-Celled Epithelioma; Report of Two Hundred Cases. R. F. Barber, Brooklyn.
129 *Early Recognition of Cancer of Stomach. J. Friedenwald, Baltimore.

127 and 128. Abstracted in THE JOURNAL, May 22, 1915, p. 1790.

129. Abstracted in THE JOURNAL, May 22, 1915, p. 1788.

Oklahoma State Medical Association Journal, Muskogee

July, VIII, No. 2, pp. 57-90

130 Cancer of Uterus. J. Overton, Tulsa.
131 Pathologic Breast and Its Treatment. F. Y. Cronk, Guthrie.
132 Early Diagnosis of Cancer of Stomach. C. J. Fishman, Oklahoma City.
133 Diagnosis and Management of Gastric Ulcer. A. W. White, Oklahoma City.
134 Surgical Aspects of Chronic Gastric and Duodenal Ulcer. H. Reed, Oklahoma City.

Washington Medical Annals

May, XIV, No. 3, pp. 131-220

135 Case of Cesarean Section in Breech Presentation. W. S. Bowen, Washington, D. C.
136 Epilepsy in Young Adults and Adolescents, with Reference to New Treatment Based on Pathogenesis. T. A. Williams, Washington, D. C.
137 Roentgen Ray Diagnostic Factor in Myositis Ossificans Circumscripta. C. A. Pfender, Washington, D. C.
138 *Unusual Case of Foreign Body in Appendix. L. H. Reichelderfer, Washington, D. C.
139 Two Cases of Ulcer of Stomach. C. S. White, Washington, D. C.
140 Case of Papillomatous Cyst of Nipple. E. A. Balloch, Washington, D. C.
141 Artificial Pneumothorax in Pulmonary Tuberculosis; Report of Cases. W. D. Tewksbury, Washington, D. C.
142 Case of Periditerculitis. A. L. Stavely, Washington, D. C.
143 Case of Plastic Operation on Abdomen and Perineum. L. A. Martel, Washington, D. C.
144 Case of Primary Carcinoma of Liver. H. A. Ong, Washington, D. C.

July, No. 4, pp. 221-280

145 Opium Habit and Its Treatment. D. P. Hickling, Washington, D. C.
146 Advance in Knowledge of Thymus Gland. E. H. Reede, Washington, D. C.
147 Relation of Physician to Coroner's Office. C. S. White, Washington, D. C.
148 Case of Hydatid Cyst of Liver—Operation; Recovery. G. T. Vaughan, Washington, D. C.
149 Case of Fibrosarcoma of Orbit Seventeen Months After Exenteration and Roentgen Ray Treatment. R. S. Lamb, Washington, D. C.
150 Case of Malignant Epithelioma Treated by One Massive Dose of Roentgen Ray. C. A. Simpson, Washington, D. C.

138. **Foreign Body in Appendix.**—Some weeks after accidentally swallowing a small, straight pin, Reichelderfer's patient complained of abdominal pain. Roentgenogram showed the pin in an upper coil of the small intestine. The patient improved and left the hospital. During the summer she swallowed three other pins, one of which she remembers was bent, the one recovered later at operation. For three months prior to her entering the hospital she complained of dull, dragging abdominal pains, more marked on the right side; her appetite was poor, but there was no loss of weight; there was obstinate constipation, the bowels moving once in five or seven days. There was some cough; temperature, pulse and respiration were normal.

A picture of the abdomen showed distinctly a bent pin in the region of the ileocecal valve. The constipation became worse; a diagnosis was made of partial intestinal obstruction, probably due to local peritonitis produced by the pin, and she was referred for operation which was performed Nov. 3, 1914. On opening the abdomen a diffuse tuberculous peritonitis was seen, both visceral and parietal peritoneum of the lower abdomen being covered with discrete tubercles; there were no adhesions or fluid, the process evidently being of recent origin, though no primary focus could be determined. There was no inflammatory reaction nor adhesions to point to the location of the pin, search for which was made difficult by the presence of tuberculous nodules and the thickening everywhere present. The pin was finally located in the tip of the appendix which was quite normal in appearance and without adhesions. The appendix was removed and the abdomen closed. The pin was bent in the shape of a letter U, the head and point being one-eighth inch apart.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Radiology and Electrotherapy, London

July, XX, No. 2, pp. 41-72

1 Roentgenography of Maxillary Antrum. N. S. Finzi and G. S. Hett.
2 Sabouraud Pastille and Roentgen-Ray Filters. A. F. Savill.
3 Some Injuries Caused by Bullets. G. A. Pirie.

British Medical Journal, London

July 3, II, No. 2844, pp. 1-40

4 Identification of Pathogenic Members of Typhoid-Colon Group of Bacilli. J. H. Smith.
5 Trypanosomes Causing Disease in Man and Domestic Animals in Central Africa. D. Bruce.
6 *Nerve Suture for Bullet Wounds. R. A. Stoney and H. Meade.
7 Localization of Foreign Bodies by Roentgen Rays. J. H. Shaxby.
8 *Treatment of Symptoms Arising from Inhalation of Irritant Gases and Vapors. W. L. Symes.

July 10, No. 2845, pp. 41-80

9 *Treatment of "Gunshot Wounds" of Knee-Joint. H. M. W. Gray.
10 *Plating of Gunshot Fractures. N. C. Lake.
11 Useful Splint for Compound Fractures of Leg. C. H. Barber.
12 Staging to Facilitate Drainage and Continuous Irrigation. E. H. Willock.
13 Trypanosomes Causing Disease in Man and Domestic Animals in Central Africa. D. Bruce.
14 Case of Chronic Intestinal Obstruction Due to Tuberculous Cicatricial Constrictions of Jejunum. S. H. Pugh.

6. **Nerve Suture for Bullet Wounds.**—From their experience with cases the authors have drawn the following conclusions concerning nerve injuries caused by modern missiles: 1. The function of a nerve may be interrupted without material injury, in which case the loss of function is only partial and returns early, probably always within a fortnight or three weeks. 2. When a nerve is partially or wholly divided loss of function is marked and permanent, and may even tend to increase. In these cases it is useless to expect spontaneous regeneration owing to the distortion and sepa-

ration of the cut ends and the great development of dense fibrous tissue which appears to follow in all cases. 3. When a nerve is divided, the sooner an operation for its suture is performed the easier it is and the greater likelihood of an early cure. In cases, however, in which the wound is septic, it may be advisable to allow time for the wound to heal. 4. Even when nothing has been done for several months, there is still a chance of a successful result if late suturing is undertaken, so that no case need be looked on as necessarily hopeless.

8. **Inhalation of Irritant Gases and Vapors.**—In the experiments conducted by Symes the "gas" (bromin vapor) was administered through a tracheal cannula. Its usual effect was rapid obstruction of the airway. Less commonly the obstruction came on gradually, several minutes elapsing before the tracing was reduced to one-half of its initial amplitude. In some cases profuse bronchorrhea appeared in the course of an hour. In all cases the relief afforded by intravenous injection of bronchodilator drugs has been little or nothing, while the same (or similar) drugs administered by inhalation have consistently given relief, which, though not always great, has at times been considerable. The drugs so far tested are the following: Amyl nitrite, injected intravenously, in suspension in normal saline, or subcutaneously without dilution, has given no relief. Inhaled, it has at times produced slight and temporary dilatation of the airway, but has more than once appeared to increase bronchorrhea.

Atropin sulphate, in intravenous doses ranging from 0.5 mg. to 10.0 mg., has been without effect on the airway; the intravenous administration of 0.1 mg. of epinephrin chlorid has on one occasion afforded slight and temporary relief, but in the majority of cases has been without benefit; intravenous injection of an infusion of stramonium leaf was without effect; inhalation of the fumes from the smouldering powdered leaf, on the other hand, has consistently relieved the obstruction. The degree of relief depends, obviously, on the amount of fume inhaled. Pulvis lobeliae cobalt, a powder containing a little lobelia in addition to stramonium, has also worked well, though, up to the present, it has not seemed more efficacious than the stramonium alone. Fumes from smouldering tobacco (or snuff) have also dilated the airway. Opium fumes have been found to give relief. The dilatation has not been great, but has, once, proved relatively lasting. Chloroform vapor has on one occasion distinctly increased the obstruction. On no occasion has it appeared to give relief.

9. **Treatment of Gunshot Wounds of Knee Joint.**—Attention is drawn by Gray to certain points which have been demonstrated by surgeons of British base hospitals to be of immense importance. In the earlier part of the war the results of the treatment of such injuries left a great deal to be desired. The great majority of such patients as recovered did so with ankylosis. The period of convalescence was usually most painful and precarious. Gray states that such infected injuries were approached with ideas regarding their treatment which experience has shown are erroneous. The chief of these were: (1) that suppurative infections of the joint demand free and prolonged drainage; (2) that drainage tubes are the best means of procuring this; (3) that these tubes must be large and must be inserted deeply into the various recesses of the joint; and (4) that strong antiseptic treatment is necessary in order to overcome the infection. These remedies are inimical to a "restitutio ad integrum," because by their deleterious action the synovial membrane and cartilages are more or less destroyed; and in most cases the best result that can be hoped for is ankylosis. On the other hand, the importance of certain factors in successful treatment were not grasped sufficiently: (1) that wounds of the knee joint which are liable to become septic demand immobilization of that joint. Few of such cases arrived at the base hospitals with an efficiently applied splint. Movement of such a knee may turn the scale in favor of sepsis, in two ways—(*a*) it may favor the entrance of sepsis to a knee previously uninfected, and (*b*) it may stimulate a virulent diffuse inflammation instead of a mild localized one.

During after-treatment the splint must be retained for two or three weeks at least. During the later stages gentle passive movement may be made daily. (2) There existed quite a widespread notion that foreign bodies in the joint should be improved "only if they lead to trouble." Fortunately, the fallacy of this view has been demonstrated, and now only those which are imbedded in the bone outside the joint are left alone, if they are not causing trouble. (3) The good effect of excision of the wound of the skin and superficial tissues, or of the whole wound when possible was not appreciated.

10. **Plating of Gunshot Fractures.**—During nine months' experience of large numbers of cases in French base hospitals almost every advocated method of treatment has been given a trial, and of these, Lake says, the plating method has given the best ultimate results. The actual plating operation is not usually undertaken for four or five days after admission, which time is spent in clearing up the acute sepsis and having roentgenograms taken. To combat the sepsis no routine method has been used; each case has been treated according to the indications. Ether has been used with apparent benefit in many cases; an antiseptic dusting powder composed of benzoic acid 25 gm., salol 5 gm., quinin 25 gm. and magnesium carbonate 25 gm. has also proved of use in very dirty cases after a preliminary cleaning under an anesthetic. This powder would appear to possess the additional advantage of being slightly analgesic. Hypertonic saline solutions both with and without corresponding vaccine treatments have also been used, but apparently, once the sepsis has been limited, the application of a Bier's bandage, or if possible of a suction cup, is more efficient in causing a flow of lymph; it has been constantly used in the treatment of these cases. Sunbaths have been freely used, and injections of colloid gold were tried in many cases. In the first two there appeared to be marked improvement, but further use showed that these were probably cases of coincidence, for the average results were not equal to those obtained by the use of antisepsis vaccines.

By the energetic pursuit of these methods the sepsis can be considerably reduced after a few days, and at this period the plating is undertaken. The incision, if one is necessary, is designed, failing anatomic contraindications, so that the plate can be applied to the most satisfactory position on the bone. In many cases the original wound only need be enlarged, but, while opening up as little fresh tissue as possible, it is essential to get good exposure and at the same time to have a thought for the future drainage of the wound. The fragments are now replaced so far as possible so as to restore the continuity of the bone. Such fragments as must obviously die are removed, all others being retained. In cases in which several large pieces are completely missing, the gap so caused in the bone is carefully maintained and the plate applied to bridge it over. The most useful type of plate for comminuted fractures is one having two screw-holes fairly close together at each end, and one or two intermediate ones. In cases in which a fresh incision has been made it can usually be sewed up completely unless needed for drainage. The drainage, however obtained, must be good, and free access for the purposes of dressing maintained. In some cases the wounds are best left absolutely open for the first few days, and partial closure undertaken later.

Dublin Journal of Medical Science

July, III, No. 523, pp. 1-80

15 An Account of Irish Medical Periodicals. T. P. C. Kirkpatrick.
16 Report of Rotunda Hospital for One Year, Nov. 1, 1913, to Oct. 31, 1914. R. E. Tottenham and E. Crichton.
17 Case of Leprosy. C. M. O'Brien.

Edinburgh Medical Journal

July, XV, No. 1, pp. 1-80

18 Bilateral Lesion in Occipital Lobes Correctly Diagnosed Twenty-Four Years Before Death. B. Bramwell.
19 Case of Osteomyelitis with Pyemia. D. M. Lyon.
20 Primary Malignant Adenoma of Liver Simulating Tropical Abscess. D. G. Marshall.
21 Practice of Medicine in Day of Molière. J. B. Adams.

Journal of Tropical Medicine and Hygiene, London

July 1, XVIII, No. 13, pp. 145-156

22 Trichophyton Violaceum Var; Khartoumense. A. J. Chalmers and N. Macdonald.

Lancet, London

July 10, II, No. 4793, pp. 55-108

23 Trypanosomes Causing Disease in Man and Domestic Animals in Central Africa. D. Bruce.
24 Loss of Personality from "Shell Shock." A. Feiling.
25 *Risks from Tuberculous Infection Retained in Books. H. Kenwood and E. L. Dove.
26 Case of Primary Hepatic Carcinoma of "Cirrhosis Carcinomatosa" Type. F. P. Weber.
27 *Treatment of Septic Compound Fractures and Wounds by Ionization of Salicylate of Sodium. R. McQueen and L. H. Boothby.
28 Relationship Between Nuclear Division and Phagocytic Power in Polymorphonuclear Leukocytes. F. E. Taylor.
29 Action of Chlorin on Blood. H. W. Hake.

25. **Tuberculous Infection in Books.**—Experiments were carried out by Kenwood and Dove to test the risks of transmission of the disease by books. The following conclusions appear to be warranted: 1. There is probably no material risk involved in the reissue of books recently read by consumptives unless the books are obviously soiled. Even then the risks are slight. 2. Nevertheless, it is desirable to provide against a possible risk, however slight. This will be secured if dirty books recently received from houses in which there is a consumptive reader are not reissued until such books have been either disinfected or placed "in quarantine" in a separate room for the period of a month. It will be desirable to disinfect such a room from time to time. When such books are very dirty they should be withdrawn from circulation. The loss involved would be much reduced in time if the borrower could be temporarily deprived of his right to borrow when a book is brought back in a badly soiled condition. 3. It would be well to demand (on a printed and gummed slip) the following precautions of all readers: (*a*) not to cough into a book; always to cough in a handkerchief; (*b*) not to moisten the fingers when reading; the hands should always be dry and clean; (*c*) always to keep the book closed when it is not being read. 4. Moist heat is a simple means of destroying the infection of tuberculosis on those library books which are not likely to be injured by such a method. For this purpose it is not necessary that the temperature should reach 100 C., although it should approximate to that; nor that the exposure should exceed thirty minutes. It is proposed to extend these experiments with the object of learning if hot moist air can be efficiently employed for the disinfecting purposes without causing injury to well-bound books.

27. **Septic Compound Fractures.**—The method McQueen and Boothby employ is to first clean up and syringe the wounds with sterilized water, or preferably with a 4 per cent. solution of sodium salicylate, and if it is necessary to swab the wounds use sterilized swabs dipped into the solution; after the wound is thoroughly cleaned to plug firmly and even tightly with sterilized gauze, or ribbon gauze for the small cavities and pockets, soaked in a warm 8 per cent. solution of sodium salicylate, then laying over all a gauze pad soaked in the same; again over this is placed a piece of lint, folded four times and saturated with the solution, which is pinned to a copper mail chain electrode attached to the positive pole of a galvanic battery, and a current from 5 to 30 milliamperes is passed for at least a quarter of an hour. The chain electrode and pad are removed and a dry piece of gauze is put over the wet dressings with some wool and kept in position by a few turns of a bandage.

Quarterly Journal of Medicine, London

July, VIII, No. 32, pp. 277-355

30 *Pituitary Gland in Diabetes Mellitus and Disorders of Glands of Internal Secretion. H. J. B. Fry.
31 Achalasia of Cardia. (Cardiospasm.) A. F. Hertz.
32 *Diagnosis and Significance of Gastric Hyperacidity. F. W. Rolph.
33 Sclerema Neonatorum. W. S. Paterson.
34 *Early Diagnosis of Pulmonary Tuberculosis. E. G. Glover.

30. **Pituitary Gland in Diabetes Mellitus.**—From Fry's study it appears that definite histologic changes occur in the anterior lobe of the pituitary in cases of diabetes in the form of adenomatous masses of eosinophilic cells, colloid invasion of the anterior lobe and areas of cellular degeneration. Histologic changes in the pituitary are absent or slight in cases of acute pancreatitis and carcinoma of pancreas. Increase in weight of the pituitary occurs in myxedema due to increase of connective-tissue elements and hyperplasia of chief cells. In goiter there is hyperplasia of the chromophil cells, especially of the eosinophilic granular cells, and increase of colloid in the interglandular cleft. No histologic changes were observed in the pituitary gland in a case of Addison's disease or in a case of status thymolymphaticus.

The following conception of the activity and mode of secretion of the gland is tentatively suggested: The eosinophilic and basophilic granular cells are derived from the chief cells by formation of zymogen granules. The granular cells represent a stage of active secretion, and glandular activity is greater toward the center and posterior border of the anterior lobe. Colloid is formed from the granules. The interglandular cleft serves as an alveolus for the temporary storage of colloid. In conformity with the upward and backward direction of development of the anterior lobe, whereby it becomes attached to the posterior lobe and infundibulum, the colloid secretion passes into the posterior lobe and up into the infundibulum and gains access to the cerebrospinal fluid. The hyaline and granular bodies are derived from cells of the anterior lobe which have been carried into the substance of the posterior lobe in the process of development. It is on these cells that the call for increased secretory activity first falls. Colloid in the interglandular cleft is then utilized, and, if there is an overdemand on the secretory activity of the anterior lobe, colloid may invade the posterior part of the anterior lobe and the cells themselves become rapidly converted into colloid, until finally areas of atrophy of the cells appear. Whether the posterior lobe activates the colloid in its passage or adds some specific secretion of its own, or merely acts as an indifferent supporting structure, must be left undecided.

32. **Diagnosis and Significance of Gastric Hyperacidity.**—Rolph is convinced that there is a connection between the symptoms of hyperacidity and the concentration of hydrogen ions in the gastric contents; such quantities of highly ionized acid combinations cause disturbance when larger quantities of less ionized do not, and there may be little or much acid found on titrating with an indicator such as Töpfer's reagent, without that revealing whether there is anything abnormal or not. In either case the hydrogen ion concentration may or may not be as high as two-hundredth normal, and it is only when it is as high as that that trouble is experienced.

34. **Early Diagnosis of Pulmonary Tuberculosis.**—Investigation was carried out by Glover on a series of forty-seven cases certified as pulmonary tuberculosis and admitted to an open-air sanatorium for prolonged treatment. Each patient was subjected to as exhaustive a series of tests as possible, with a view to finding in the first place in what percentage a diagnosis of active disease could be confirmed, and in the next what tests or series of tests give the most reliable results in diagnosis. They were chosen in every instance after a consideration of the sputum report on admission. The tests finally applied to these cases were: The investigation of the complement-fixation reaction, the estimation of the tuberculo-opsonic index, and the injection of test doses of subcutaneous tuberculin.

The following conclusions are based on the results of this investigation: (1) that about 62 per cent. of cases coming under observation as supposed early phthisis, but with no bacilli in the sputum, prove to be negative; nevertheless, (2) that such negative cases may present clinical signs of impairment of percussion note, breath sounds and resonance at, at least, one apex; and (3) that moist sounds in such cases are almost invariably absent; therefore, (4) it is not justi-

fiable to diagnose active tuberculosis on the strength only of impairment of an apex; (5) that active disease confined to one apex with a repeatedly negative sputum is not common; (6) that when moist sounds are present, further investigation is needed to exclude or confirm the presence of active disease; (7) that when this investigation takes the form of the complement-fixation reaction along with the estimation of the opsonic index (if necessary, repeatedly), a final diagnosis can be made without recourse to test injections of tuberculin.

Annales de Gynécologie et d'Obstétrique, Paris

May-June, XLI, No. 11, pp. 481-544

35 *Hygiene of the Child Before Its Birth. A. Pinard.
36 The State Should Care for Children Born from Rape. A. Herrgott.
37 Rape and Telegony. G. Barrier, A. Pinard and E. Rabaud.

35. **Prenatal Hygiene.**—Pinard discusses here the hygiene of pregnancy, which includes that for both mother and fetus, and cites old writers from Soranus of Ephesus in the first century down. Their advice to the pregnant woman does not differ much from the measures recommended at present, except that exercise on foot was always advised against by the older writers. In all the literature on the subject, down to the end of the nineteenth century, there does not seem to be any mention of the hygiene of the fetus or of the working woman—all the advice was addressed to women who had private conveyances at their disposal. In 1875 Tarnier proclaimed that the urine of every pregnant woman, at least during the second half of the pregnancy, should be subjected to a careful examination. Pinard later emphasized the necessity for determining the position of the fetus during the last three months. Pinard also established the fact that the child is carried longer and is more perfectly developed at birth when the woman can rest during the last few weeks. Fatigue is an important factor in premature deliveries, and he has been preaching for years that wage-earning women should be allowed to rest during the last three months of a pregnancy. This was adopted as a resolution at the 1900 International Congress for Hygiene, and again at the French national Nantes congress. Pinard urges that as children are taught to be careful of and protect the honor and the property of the family, they should be taught that they have still another sacred possession to guard, namely, the health of the future members of the family, their posterity. He declares that this should be taught in the schools, especially the idea that all individuals are above all seed-bearers, *porte-graines*, and the idea of pathologic heredity. He emphasizes further the important facts that the human ovum cannot develop normally unless the uterus is sound, and hence that hygiene before gestation is as necessary as for the pregnant woman.

Annales de Médecine, Paris

April, II, No. 3, pp. 223-314. Last Indexed June 5, p. 1940

38 *Influence of Parabiosis on Development of Inoculated Cancers in Rats. B. Morpurgo.
39 Experimental Siderosis and Melanoderma in Relation to the Functioning of the Spleen. P. Chevallier.
40 Congenital Malformation of Large Vessels at Base of Heart; Two Cases. E. Lenoble and A. Gougeon.
41 *Meningococcus Carriers. F. Bezançon.
42 No Efficient Substitute for Cold Baths in Typhoid. (La balnéation froide et les méthodes rivales dans le traitement de la fièvre typhoïde.) L. Bernard.

38. **Parabiosis Does Not Affect Development of Cancer.**—The parabiosis did not seem to modify in any way the susceptibility of the individual rats to the inoculated sarcomas.

41. **Meningococcus Carriers.**—Bezançon comments on the difficulty of detecting meningococci in healthy carriers as many microbes which seem to be meningococci yet fail to be agglutinated by the antimeningococcus serum, while cocci of other families may be agglutinated by this and also by the antiparameningococcus serum. To add to the difficulty, the true meningococcus is extremely frail, its isolation in pure cultures is difficult, and the agglutination test gives the above dubious findings.

Archives Mens. d'Obstétrique et de Gynécologie, Paris

June, IV, No. 6, pp. 225-256

43 *Influence of Intra-Uterine Obstetric Maneuvers on the Morbidity and Mortality of Parturients. J. de Groot.

43. **Intra-Uterine Maneuvers and Childbirth Morbidity.**—De Groot has been studying this subject in the records of the maternity service connected with the University of Utrecht. He classifies the cases according as internal exploration was the only internal measure, or as complications required different measures. Among the latter he classifies the cases requiring tamponing or artificial delivery at term or before—a total of 355 cases without fatal infection. He describes the technic followed in internal exploration and preparing the woman for it, and states that between 1899 and 1908 no internal examination had been made in 41 cases in which fever developed later, or in 31 afebrile cases, while internal exploration was done on an average over five times in 441 persistently afebrile parturients, and five times in 446 who developed fever. The records show no advantage from gloves on this morbidity. In the 84 cases requiring bougie premature delivery, there were 3 cases of grave and 10 of mild infection. De Groot thinks that these data and others cited demonstrate that the morbid influence of germs from without depends on the state of the vagina when delivery commences. The microbes already in the vagina do not seem to be very dangerous. It thus proved possible to tampon the uterus and the vagina in 117 cases, with severe infection in only 15 cases and no death, and mild infection only in 22. The one fatal case in this group was explained by extraneous causes. For this reason the intra-uterine tampon is extensively used, and, relying on this, the placenta is extracted by hand when other measures fail.

The maternity service consists of a clinic with an average of about 300 childbirths a year. Here the pregnant women are examined and they are supervised afterward at home. Connected with this is an outpatient department, the *service de Policlinique*, which, to a population of 118,000, conducts about 1,500 deliveries a year. Each second-year student assists at several deliveries in the *Clinique*, after having taken a course in external examination of the pregnant woman. Before the final examinations, each medical student has to spend two months in the service of the *Policlinique Obstétricale*, living in a house devoted especially to this purpose and maintained by the medical students themselves. The number of students in this *Praktikanten-Huis* is always six or seven a month. The telephone and the bicycle guarantee prompt service, and the sterilization technic, etc., are the same as in the *Clinique*. The equipment provides facilities for isolating the woman from her environment, and the morbidity is extremely low. In 79 cases of intra-uterine tamponing there was infection in only 22 cases, mild in all but 9, and no deaths.

Bulletin de l'Académie de Médecine, Paris

June 22, LXXIII, No. 25, pp. 707-741

44 Extension Brace for Plaster Cast. (Appareil de contention et de réduction des fractures.) S. de Santa-Maria and P. Bazy.
45 The Shock from Explosion of a Shell. (Le "syndrome commotionnel," au point de vue du mécanisme pathogénique et de l'evolution.) A. Mairet and Others. (Quelques manifestations nerveuses, déterminées par le "vent de l'explosif.") P. Ravaut.
46 Auscultation of Venous Pulse. O. Josué.
47 War Typhoid; 500 Cases. H. Bourges (Brest).

Presse Médicale, Paris

June 30, XXIII, No. 29, pp. 229-236

48 What France Has Contributed to the Medical Sciences in the Last Fifty Years: General Pathology. C. Achard; Internal Pathology. J. Castaigne.

July 1, No. 30, pp. 237-244

49 Pyoculture. P. Delbet. See THE JOURNAL, July 10, 1915, p. 183.
50 *Gastritis from Asphyxiating Gases. Loeper and others.
51 Favorable Outcome of Disarticulation Below the Astragalus. P. Desfosses.

50. **Gastritis from Asphyxiating Gases.**—Loeper relates that the irritation from the chlorin gas sent into the trenches extends down the esophagus into the stomach, and these changes occur as frequently and as early as the changes in the air passages. The latter dominate the clinical picture

and the disturbances in the digestive apparatus are usually overlooked at first. They come into prominence as the respiratory phenomena become attenuated, and the gastritis keeps up for several weeks. He describes the clinical picture observed in four typical cases out of a group of six asphyxiated in April with gas fumes or gas from an asphyxiating bomb. The disturbances from the latter were most severe. Besides the signs of diffuse bronchitis and congestion of the lungs, spitting of blood, dyspnea (respiration rate 40 and 60), there were extreme weakness, actual paresis of the legs and a pulse of 56, 70 or 80. Nausea and vomiting occurred at first, then came a sensation of constriction and burning in the throat and esophagus and then painful intermittent cramps in the stomach. One man vomited black blood the next day. They were given 10 gm. a day of sodium bicarbonate, and this relieved the stomach symptoms. But they returned the fifteenth or sixteenth day with unmistakable signs of gastritis, and the stomach region was tender, but there did not seem to be hyperchlorhydria. After four days of a strict milk diet, blood was found in the stools and stomach rinsing fluid, indicating erosions, and accompanied by a train of nervous reactions. If the men had swallowed at once a 4 or 5 per cent. solution of sodium hyposulphite, the poisonous gases would have been promptly neutralized. Addition of a little atropin would have reduced congestion. Later, sodium bicarbonate and sedatives are the main reliance. A strict milk diet seems imperative, with perhaps bismuth carbonate to treat the erosions and other lesions. Under such treatment the gastritis gradually subsided.

Beiträge zur klinischen Chirurgie, Tübingen

April, XCVI, No. 3, pp. 271-398. Last Indexed July 10, p. 202

52 *Injury from Shell Without Direct Contact. (Die Granatkontusion.) R. Gaupp.
53 Disappointing Results from Use of Hollow Bone to Protect Sutured Nerve. (Deckung grösserer Nervendefekte durch Tubularnaht.) Steinthal.
54 *Experiences to Date with Wounds of Peripheral Nerves. Heile and Hezel.
55 *Double and Multiple Nerve Implanting to Bridge Gaps. (Doppelte und mehrfache Nervenpropfung bei Schussverletzungen der Nerven.) F. von Hofmeister.
56 Surgery in the Field Ambulance. (Chirurgie im Kriegslazarett.) Faisst.

52. **Shock from Shell Explosions.**—Gaupp has noticed that the direct effects of the contusion from the air are of extreme variety, as also the various conditions that may be observed afterward. Sudden death from the shock alone is not rare; immediate unconsciousness is common. It may last for hours or weeks and be followed by total loss of memory for the period since the explosion. At the same time, he says, most of what has been described as the effects of the injury are in reality nothing but traumatic hysteria. Schuster has noted that when the shell explodes near a sleeping person, it does not induce the nervous and mental disturbances otherwise observed. This throws light on the importance of the fright as a factor in the shock from an exploding shell. The emotional-neurotic factors are supplemented by the traits for which physical exhaustion is responsible. An exhausted nervous system feels the effect of the explosion more than when fresh or well rested. Treatment should be mainly psychologic, tranquilizing the patient by repose and verbal suggestion and having his mates rouse him from his stupor by friendly admonitions.

54. **Wounds of Peripheral Nerves.**—Heile and Hezel give sixteen colored plates to show the various kinds of wounds encountered and the preferable technic for treatment of each variety.

55. **Multiple Grafting in Sound Nerves to Bridge Gap in Nerves.**—Von Hofmeister gives the details of twenty-four cases of double or multiple nerve grafting, with five colored plates illustrating his special technic. It is based on the assumption that a resected nerve will regenerate along a bridge formed by a sound nerve better than without this support. It serves merely as an indifferent substance, but the living nerve tissue seems to be particularly adapted for this purpose, the fibers of the axis cylinder of the resected nerve automatically finding their correct way through it. The resected stumps are implanted in one sound nerve. For example, a gap of 10 cm. in the ulnar nerve was thus bridged by implanting the stump of the nerve above and below the gap in the sound trunk of the radial nerve. The free ends of the stump are implanted in such a way that they face each other, buried in lengthwise incisions in the radial nerve, fastened in place with fine catgut stitches, taking up as little as possible. In one case after the ulnar nerve had been bridged in this way, the gap of 12 cm. in the median nerve was bridged by implanting the stumps by the same technic in the ulnar nerve, and the middle cutaneous in the median nerve. Thus the three injured and resected nerves were bridged by other nerve trunks, entirely sound or intact between the implants.

He gives the full details of 24 cases in which this method has been applied in treatment of paralysis in wounded soldiers, 5 in January, 8 in February and 6 in March. The results already attained are very encouraging. In one case gaps of 10 and 12 cm. in the ulnar and median nerves were thus bridged, and in four months active pronation was possible; three fingers could be slightly flexed and traces of sensation are manifest. The results in this case, as the volitional control of the muscles has been regained to such an extent, and this without the co-movements of other muscles, such as persistently mar the effect of certain nerve anastomoses, certainly demonstrate that the technic has a future. He is careful to refrain from injuring the fibers of the bridge nerve, merely working the implants in between the fibers, hoping that the regenerating nerve will make its way along between the fibers of the bridge nerve.

Berliner klinische Wochenschrift

June 14, LII, No. 24, pp. 625-652

57 Mercury Spray. (Quecksilbergleitpuder—Pulvis fluens hydrargyri.) P. G. Unna.
58 *Serodiagnosis of Glanders in Four Cases in Man. (Zur Rotzdiagnose beim Menschen.) E. Gildemeister, J. A. C. W. Jahn and G. Wolff.
59 *Nutrition and Growth of the Prematurely Born. (Ernährung und Wachstum der Frühgeborenen.) L. Langstein.
60 Epidemic Diseases in War. (Erfahrungen über die Behandlung der Kriegsseuchen.) E. Leschke.
61 Explosive Action of German Bullet. (Explosivwirkung des deutschen Infanteriemantelgeschosses Mantelreisser.) K. Kolb.
62 Mikulicz' Disease and Allied Conditions. (Angeborene und erworbene symmetrische Hypertrophie der Speicheldrüsen und des Lymphgefässensystems des Halses.) J. W. M. Indemans.
63 Scarlet Fever, Diphtheria and Social Position. F. Reiche.
64 Farm Colonies for Wounded Soldiers. (Zur Verwundetenfürsorge.) R. du Bois-Reymond.

58. **Glanders in Man.**—In the four cases reported the serologic tests, agglutination, fixation of complement and conglutination all gave instructive positive findings. After considerable research on the subject of serologic differentiation, the writers state that agglutination at 1:100 or 1:200 does not seem specific; at 1:400 it suggests glanders, and at 1:800 renders it highly probable. Conglutination seems to be specific and may substitute agglutination. Three of the four cases were acute and fatal.

59. **Nutrition and Growth of the Prematurely Born.**—Langstein has made a special study of the conditions in regard to nutrition and development in 250 prematurely born children. He was able also to trace their development later. He had at his disposal in the Augusta Victoria institution an incubator room in which the temperature was kept constantly at 26 to 30 C. and the humidity at 60 per cent., but he found that the children did not thrive in this room. It facilitated bathing and weighing, but the premature babies did not do so well as in a hot-water incubator (*Wärmewanne*) in a room with ordinary ventilation. The prematurely born weighing from 900 to 1,500 gm., require the incubator, but those of 2,000 gm. and over do not need it, but do equally well in an ordinary crib with hot-water bottles. The breasts can be milked by hand and the milk is given the child until it gets strong enough to nurse. In the home it requires much energy and perseverance to get the breasts emptied by hand in this way, and lactation duly promoted.

Langstein's experience is all in favor of feeding the infant through a catheter, and he is convinced that many of the children would have died of inanition if he had attempted to feed them in any other way. Only a very small proportion are strong enough to suck; even when they suck from the bottle for the first two or three days, after that they give up and suck no more, growing more and more somnolent. The jaundice is responsible for this somnolency, and only when the jaundice subsides does the child rouse enough to suck; then the catheter can be dispensed with. He uses a No. 9 or 10 Nélaton, introducing it through the mouth every two hours, and has never had a mishap with it, scarcely even waking the child. He gives only 5 or 10 gm. breast milk at first, but gradually increases to 20 or 30 gm. and in two weeks to 250 or 300 gm., giving nine or ten feedings in the twenty-four hours. The smaller the child the greater the need for shorter intervals; as the child's weight approaches 2,000 gm. they can be lengthened.

In his study of the metabolism of the prematurely born he was impressed with the defective utilization of fat, even the fat of breast milk. Artificial food is an extremely risky experiment for these children. Buttermilk to supplement an inadequate supply of breast milk has rendered good service. On buttermilk alone the child may increase in weight, but it looks pale and bloated and seems less resistant than others. In any event, buttermilk should not be kept up for more than a few weeks. The majority of the prematurely born develop rachitis, and even breast milk is no certain protection against it. Craniotabes by the third or fourth month is the rule, and spasmophilia is more common and develops earlier in the prematurely born.

Langstein thinks there can be no doubt that both rachitis and spasmophilia have some connection with the metabolism of lime. This is especially probable in the prematurely born, as the earlier they are born the less the supply of lime in them, as we know that mineral substances do not pass from the mother to the fetus until in the last month of the pregnancy. Breast milk has very little lime content, and he seeks to remedy this deficit in lime by giving the prematurely born, from the very first months, some calcium salt, in combination with cod liver oil. It is his impression that this has protected against rachitis, and none of the children thus treated have developed spasmophilia in a severe form. None of them has even had convulsions, and the calcium treatment has certainly never done harm. He also makes a point of giving iron early, and is convinced that it has helped many to outgrow the early anemia.

Measurement every week or so of 100 prematurely born children showed that the laws of physiologic growth prevail here the same as under normal conditions. A weight of 1,000 gm. and a length of 34 cm. seem to be the limit for normal development. Some children still smaller than this have thrived, but they are exceptions and they never reached the normal standard. In 4 cases the mothers' nephritis was the cause of the premature birth, but these children all developed well. In 5 other cases eclampsia was the cause of the premature birth, and one child died and the others did not thrive well. Tuberculosis or syphilis in the mother always had a very deleterious influence on the prematurely born offspring.

There is thus every prospect for raising a healthy child if it weighs 1,000 gm. or over at the premature birth. He bases the prognosis in large measure on the turgor. An absolutely relaxed infant with bad turgor and poor tonicity is almost certainly doomed. On the other hand, even the smallest sized child with good tonus and good turgor nearly always realized the hopes placed on it. The turgor seems to be connected in some way with the water content. This seems to have something to do with the alkali constituents of the organism. The assumption seems plausible that the bad turgor and the alkali deficit entail an incapacity for living. Attacks of asphyxia during the first few days do not render the prognosis graver, but they should always be regarded as a bad sign when they occur during the second week.

The experiences related justify systematic induced premature delivery when the pelvis is so contracted as seriously to impede delivery. Everything must be prepared in readiness to give the prematurely born the proper care or take it where it is obtainable, guarding scrupulously against chilling in transit. Many of the prematurely born brought to his institution were far below 30 C. (86 F.) when received. There are portable incubators now available which avoid all danger from this source.

Deutsche medizinische Wochenschrift, Berlin

June 17, XLI, No. 25, pp. 725-752

65 Welfare Work for Blind Soldiers. (Kriegsblindenfürsorge.) E. Krückmann. Concluded in No. 26.

66 *Skin and Venereal Diseases During the War. (Verbreitung, Bekampfung und Behandlung der Haut- und Geschlechtskrankheiten im Kriege.) W. Scholtz.

67 *Effect on the Blood of Deep Radiotherapy. (Klinische Blutuntersuchungen bei der gynäkologischen Tiefentherapie.) L. Nürnberger. Commenced in No. 24.

68 *Syphilitic Contracted Stomach. (Zum Schrumpfmagen auf luetischer Basis.) E. Mühlmann.

69 Forensic-Psychiatric Experiences with Soldiers. M. Kastan.

70 Tests of Coolidge Tube. (Die Coolidge-Röhre der A. E.-G.) H. E. Schmidt.

71 Splint with Extension for Fractures. (Eine Lagerungs- und Extensionsschiene für Extremitäten-Schussfrakturen.) H. Wohlgemuth.

72 *Position Treatment of Wounded Nerve. (Die Lagerungsbehandlung der Nervenverletzungen.) L. Mayer.

73 Detention of Captured Medical Officers. (Die Festhaltung gefangener Militärärzte.) J. Schwalbe.

66. **The War and Skin and Venereal Diseases.**—Scholtz writes from the eastern arena of war that the absence of eczema among the troops is a constant surprise. He regards this as evidence that the internal factors should be regarded more in the treatment of eczema. The skin gets no care, the clothing is not changed, and other conditions apparently invite eczema, but no severe cases are encountered. The coarse food, living out of doors and constant exercise keeping the blood circulating briskly ward off skin diseases. In regard to venereal diseases, also, the conditions, he says, are better than in times of peace, as the infected soldiers are compelled to take treatment, so that on the whole he is convinced that the war will lead to a comprehensive sanification of the male population. During peace, he says, the cases of venereal disease in the large cities average 25 per cent. for college students; 16 per cent. for clerks and 8 per cent. for workmen. The compulsory treatment of all the infected soldiers will lead to a decline in the number of cases throughout the populace. The increase in the general proportion of cases of venereal disease during the war seems to be only among the married men. They form a third of all the cases, but they do not represent a danger later for the populace at large. Scholtz urges that the discipline of martial law and the other opportunities afforded by the war should be systematically utilized for the sanification from venereal diseases of the male population and of prostitution.

67. **The Blood Under Radiotherapy.**—Nürnberger examined the blood repeatedly in 20 women given radium or Roentgen or radioactive treatment for gynecologic diseases. Nothing was found that suggested permanent irreparable injury of the blood-producing organs. Experiences have been published, however, by others, which indicate that the prolonged action, over years, of even small doses of radiant energy are liable to damage the blood-producing organs. He refers only to what he calls "deep therapy"; after each application—either at once or with an interval of one or two days—the total leukocyte and neutrophil count runs up abruptly, while the lymphocytes disappear. After from one to three days the total leukocyte and polynuclear count drop to normal or subnormal figures, while the number of lymphocytes increases. By the end of six or eight days the blood process has run its course. On repetition, it is less pronounced.

68. **Contracted Stomach on Basis of Syphilis.**—Mühlmann compares a case in a woman of 27, syphilitic for seven years, with Hemmeter's, and two other cases. All developed on the basis of syphilis acquired two, four or twenty years before. Symptoms of dyspepsia ushered in the stomach trouble, and by the end of a year the signs of a small,

shriveled stomach were unmistakable, the capacity reduced to one glass or 0.5 liter of fluid, everything over this amount being vomited, while the patients are ravenously hungry all the time. This latter feature and the lack of cachexia exclude cancer, as also the differences in the roentgenogram. Gastroenterostomy was done in his case, but when the disturbance is not very severe, treatment for syphilis and other internal measures may bring sufficient relief.

72. **Position Treatment of Wounded Nerve.**—Mayer emphasizes the necessity for applying a splint to immobilize an injured nerve in the best position. It is as indispensable here as for a fractured bone, and saves weeks of treatment and avoidable operations.

Medizinische Klinik, Berlin

June 13, XI, No. 24, pp. 661-686

74 **Treatment of Infected Wounds of the Soft Parts.** (Infizierte Weichteilwunden.) J. Schnitzler.
75 Prophylaxis and Treatment of Venereal Disease in the Active Army. (Zur Verhütung und Behandlung der Geschlechtskrankheiten im Felde.) H. Eicke.
76 Injury of the Skull or "Drunk?" (Schädelverletzung oder Trunkenheit?) F. Strassmann.
77 *Treatment of Talipes Cavus. (Zur Behandlung des Hohlfusses.) A. Ritschl.
78 Bacteriotherapy of Typhoid. G. Holler. Commenced in No. 23.
79 Tardy Periosteum Lesion in the Leg After Dysentery; Four Cases. J. Rauch.
80 Hot Air Box for Extermination of Vermin. R. Pressburger.
81 Reliability of Weiss' Chromogen Permanganate Differential Test for Typhoid Even in the Vaccinated. M. Rhein.
82 Diagnosis of Fracture of the Spine. (Wirbelbrüche.) H. Engel.

77. **Treatment of Talipes Cavus.**—THE JOURNAL described, March 20, 1915, p. 1039, Ritschl's method of correcting hump deformity by applying strong pressure from a band passed over the hump and down over two supports below on each

Cast and strap to apply pressure in correction of talipes cavus.

side, the ends of the strap then brought up again over the hump and band and buckled together. He here describes the application of this principle to the treatment of talipes cavus, and reports encouraging results with it.

Münchener medizinische Wochenschrift, Munich

June 15, LXII, No. 24, pp. 805-856

83 *Diagnosis of Typhus. (Zur Fleckfieberdiagnose.) E. Fraenkel.
84 Neosalvarsan in Typhoid. P. Jacob.
85 *Urethra Calculi. (Harnröhrensteine.) Gies.
86 Successful Operation for Ruptured Aneurysm of Common Carotid and Internal Jugular. W. Rühl.
87 Simplified Technic for Making Cholera Vaccine. (Choleraimpfstoff.) B. Fischer, L. Bitter and G. Wagner. Commenced in No. 23.
88 Surgical Treatment of Sinusitis After Wounds in War. (Nebenhöhleneiterungen nach Kriegsverletzungen.) Denker.
89 Wounds of the Nose and Sinuses. (Schussverletzungen der pneumatischen Schädelhöhlen.) L. Grünwald. (Verletzungen und Erkrankungen der Nase und ihrer Nebenhöhlen im Kriege.) O. Seidel.
90 Wounds of the Larynx. (Kehlkopfschüsse.) M. Nadoleczny and F. L. Böhler.
91 *Blunders in Military Surgery and How to Avoid Them. (Aerztliche Fehler bei Ausübung der Kriegschirurgie.) C. Goebel.
92 Extermination of Vermin. (Zur Bekämpfung des Ungeziefers im Felde.) K. Herxheimer and E. Nathan.
93 Wounds of the Lungs. (Lungenschüsse.) Bonne.
94 Vaccination Against Cholera. (Choleraschutzimpfung im Balkankrieg, 1913.) A. E. Tsakalotos.
95 Salol Locally Destroys Pyocyaneus. C. Meyer.
96 The Blood Pressure as Guide in Estimating Heart Disturbances. K. Vollmer.
97 Position Treatment of Fractured Femur. (Behandlung von schwierigen Oberschenkelfrakturen in der Sitzlage.) L. Drüner.
98 Improvised Spring Device for Radial Paralysis. K. Croissant.
99 One-Day Pneumonia. (Das gehäufte Auftreten einer ins Gebiet der sogen. Febris ephemera gehörigen Krankheit bei den Truppen des Ostheeres.) G. Landmann.

83. **Differential Diagnosis of Typhus.**—Fraenkel relates that further experience has abundantly confirmed his statements in regard to the characteristic histologic findings in the roseola of typhus patients. The microscope thus serves to differentiate typhus at an early stage. The anatomic substratum is a necrosis of the walls of the smaller arteries, and the accumulation of cells at these points. If typhoid bacilli are found in the blood with these histologic findings, the patient must have both typhoid and typhus. Necropsy findings in typhus show nothing else macroscopically characteristic, but the microscope reveals the typical necrosis in the walls of the small and smallest arteries. He describes the technic with which these changes are shown up best with the Pappenheim panoptic stain.

85. **Urethra Stones.**—One quite large and eleven smaller calculi had evidently developed in the urethra of a tailor of 53. He had never been able to urinate freely.

91. **Blunders in Care of the Wounded.**—Goebel declares that asepsis is realized more nearly when no trust is placed in sterilizing the hands or rubber gloves, but everything is handled with sterilized forceps. This has the further advantage of saving the hands. When the dressings are too voluminous to be removed with forceps, some orderly should be called on to do it, not the nurse or surgeon. Too many forget that the part of the dressings directly in contact with the wound should never be seized by the hand. He advises drawing the rubber glove over a well-powdered lisle thread glove before it is sterilized and leaving the latter inside it until ready to put the glove on. Any kind of an impermeable covering for a dressing is denounced nowadays. When the dressing is carried around the limb it is liable to have a constricting action when soaked with blood and pus. The tampon is often applied so tight as to do harm; it is better to pack the gauze loosely. He has often found a mass of retained pus beneath a tampon.

Another frequent blunder is to include healthy joints and parts in the dressing unnecessarily. Immobilization of the uninjured joint soon avenges itself. With fractures of the femur, the hip, knee and ankle have to be immobilized; with a fractured leg, the knee and the ankle; with a fracture of the upper arm, the shoulder should be left free to some extent. With fracture of the forearm, the arm should be immobilized in supination, what he calls the "spit palm position," as with it one might spit into one's hand, without immobilizing the elbow. The immobilized joint should be placed in a position to favor functioning later; slight dorsal flexion is much better than extension for the wrist, or even volar flexion. The elbow should be flexed at a slightly acute angle; the shoulder kept in abduction. The tendency of the thigh to rotate outward is seldom considered enough. The ankle should always be at a right angle.

Plaster casts are proving extremely useful for the wounded, but they must always be made with a large opening left. A glass or a cup set on the dressing below is an aid in making a fenestrated cast.

Goebel says that in extension of a fractured femur, he has seldom found the weights heavy enough. He advises raising the foot of the bed at least 9 inches higher than the head, and adds that a weight of over 20 pounds may be needed. The patient should be prevented from sinking down too deep in the mattress. Wounds of the jaws should get specialist treatment, and at the earliest possible moment. Splints relieve the pain from a soft part wound as well as with fractures. In conclusion he urges a preventive injection of antitetanus serum when the man was wounded during fighting in a wooded region. Also systematic and prolonged administration of hexamethylenamin in every case of injury of the skull with danger of meningitis.

Wiener klinische Wochenschrift, Vienna

June 17, XXVIII, No. 24, pp. 637-664

100 Accidental Heart Murmurs. (Zur Klinik der akzidentellen Herzgeräusche.) M. Heitler.
101 Varying Behavior of the Mitral and Tricuspid Valves with Weak Heart. (Verschiedenes Verhalten des Mitral- und Trikuspidalostiums bei Herzschwäche.) M. Heitler.
102 *Differential Diagnosis and Prophylaxis of Typhus. (Flecktyphus.) H. Boral.
103 Insects as Conveyors of Diseases. (Ueber Kleiderläuse und die Uebertragung von Krankheiten durch Arthropoden.) J. Fichiger.
104 Fumes of Chemicals in Extermination of Lice. (Zur Methodik der Läusevertilgung durch Dämpfe chemischer Agentien.) A. Felix.
105 Tuberculous Laryngitis in Child of 2. E. Germonig.
106 Mumps in Men Over Thirty; Seventeen Cases in One Troop. H. Moser and A. Arnstein.
107 Improvised Universal Suspensory. K. Ullmann.
108 Wounds of the Testicles in War; Eighteen Cases. T. v. Mutschenbacher.

102. Typhus.—Boral states that it is almost impossible to distinguish between typhus and typhoid in the early stages except by serologic and bacteriologic tests. His extensive experience has confirmed anew that a typhus patient absolutely free from vermin and nits is not a source of infection to others.

Zeitschrift für Urologie, Leipzig

IX, No. 5, pp. 161-200

109 *Electrocoagulation of Bladder Tumors. (Zur Hochfrequenzbehandlung von Papillomen in der Nähe des Orificium internum vesicae.) H. Lohnstein.
110 Wounds of the Urinary Apparatus in the War. (Die deutsche Urologie im Weltkriege.) H. Lohnstein. To be continued.
111 Urologic Work on the Firing Line. (Urologisches vom Kriegsschauplatz.) A. Rothschild.

109. Electric Coagulation of Bladder Tumors.—Lohnstein gives an illustrated description of a fulguration catheter which can be used for various purposes in the bladder besides application of the high frequency current, all under direct visual inspection.

Gazzetta degli Ospedali e delle Cliniche, Milan

June 17, XXXVI, No. 48, pp. 753-767

112 Habitual Abortion and the Wassermann Reaction. L. A. Oliva.
113 Improved Roentgen Technic for Locating Foreign Bodies. V. Maragliano.

Riforma Medica, Naples

June 26, XXXI, No. 26, pp. 701-728

114 Modification of Reducing Power of Cholera Vibrio in Different Environments. L. Mazzetti.

July 3, No. 27, pp. 729-756

115 Roentgen Localization of Foreign Bodies. (Nuovo metodo di localizzazione dei corpi stranieri.) V. Maragliano.
116 Synthetic Study of Arrhythmia. (Dei concetti fondamentali che informano le aritmie.) O. Cantelli. Commenced in No. 26.

Semana Medica, Buenos Aires

June 3, XXII, No. 22, pp. 689-718

117 Medical Men in Argentine Culture, Especially J. M. R. Mejia. J. Ingenieros. Commenced in No. 21.
118 *Inversion of Reflexes. (Inversion de reflejos. Sobre una nueva forma de inversion del patelar.) F. M. Maglione.

118. Inward Rotation of Foot as Knee-Jerk.—Maglione's patient was a man of 39 with specific dorsolumbar myelitis. When the quadriceps is tapped to elicit the knee-jerk, the only result is a rotation inward of the foot. It describes an arc of 35 to 40 degrees.

Hospitalstidende, Copenhagen

June 30, LVIII, No. 26, pp. 637-660

119 *Jaundice of the Newly Born. (Icterus neonatorum.) F. Bang.

119. Jaundice of the Newly Born.—Bang describes the various methods for determining the content of the serum in bile pigment, and relates that in his extensive research on the subject he found that the blood in the umbilical cord always contained a notable amount of bile pigment. The findings were positive in all the twenty-four infants examined, even at once after birth, consequently icterus in the newly born may be considered a physiologic condition. He found it the same in infants delivered by cesarean section, so the birth trauma cannot be incriminated. In all the children examined the proportion of bile pigment in the blood constantly increased during the first few days, but it began to subside after the third, fourth or fifth day, although there was still a positive reaction in all on the tenth day. It is thus only a question of degree between the newly born with or without clinical icterus. All have the bilirubinemia to some extent, and this fact demolishes some of the theories that have been advanced to explain icterus neonatorum. He used the Gmelin-Sunde technic for his tests, that is, the blue-green ring that forms at the line of contact between the serum and the reagent, which is a mixture of 300 parts nitric acid and 0.06 parts sodium nitrate. The interval before the color reaction occurs is an index of the intensity of the icterus. The number of red corpuscles increases rapidly after birth. He theorizes to explain these facts.

Ugeskrift for Læger, Copenhagen

July 1, LXXVII, No. 26, pp. 1057-1088

120 Hydrogen Dioxid Quantitative Test for Pus in Urine. (Metode til kvantitativ Pusbestemmelse ved Hjælp af Brintoverilte.) A. Norgaard.
121 Drug Eruption. (Tilfælde af Atophanexantem.) M. Brammer.

Nordisches Medizinisches Archiv, Stockholm

XLVIII, Internal Medicine, Nos. 3-4. Last Indexed Feb. 27, 1915, p. 784

122 *Research on the Nutrition and Metabolism of an Infant with Special Regard to Artificial Feeding. (Ernährung und Stoffwechsel des Säuglings.) E. Hellesen.
123 Production of Uric Acid in Man. IV. (Bildung der Harnsäure beim Menschen.) J. P. Chrom.
124 Experimental Scorbutus in Guinea-Pig Fetus and Young. (Ueber experimentell hervorgerufene Morbus Barlow an Feten und Neugeborenen.) A. Ingier.
125 Heller's Test for Albumin. (Beobachtungen bei Heller's Albumin-Probe.) K. A. H. Morner.
126 *Alkaptonuria. G. Söderbergh.

122. Metabolism of Infant on Artificial Food.—Hellesen's report of his prolonged research in this line fills 120 pages and is accompanied by thirty-one tables showing the metabolic findings and the conditions in regard to nourishment. The data confirm the view that carbohydrates spare the carbon and the nitrogen reserves better than fat. The research demonstrated beyond question that carbohydrate food has a marked influence on the mineral metabolism, especially of sodium. He declares that there seems to be some mysterious specific action here. Carbohydrates and fats therefore cannot substitute each other indiscriminately. Each has its specific action on the whole metabolism of force and matter, and this is a factor of great importance for their rôle as food. The research was carried out on a healthy 5 months babe, of healthy parents and breast fed till the age of 4½ months. The work was done at the Auguste-Victoria institution near Berlin which is fully equipped for all such research, as it is the central headquarters of the welfare work for and study of infants.

126. Alkaptonuria.—Söderbergh illustrates his 130 page article with nineteen plates, eighteen other illustrations, and seventeen graphic tracings. He discusses the clinical findings with alkaptonuria, and especially as connected with the Wassermann reaction and deforming alkaptonuric ostitis. Most of the illustrations are of a case in his own practice, the patient a farmer of 42. He compares with this case the three others that have been published in Sweden. The behavior of the Wassermann reaction, and whether the bone changes represent a new and special bone affection are the questions he sought to answer in his study of the four cases. The Wassermann reaction was strongly positive in his case at first, but became negative under a month of mercurial inunctions. It veered promptly to positive again in three of the four cases after the men had taken one morning three doses of 5 gm. each of tyrosin, the mother substance of homogentisic acid. Syphilis is extremely improbable in these cases; there are no signs of it and nothing in the antecedents to suggest the possibility of it, and yet the Wassermann reaction is positive. The bone changes of alkaptonuric ostitis resemble most closely those of Paget's disease of the bones. It is a suggestive coincidence that in this too the Wassermann reaction is often found positive with nothing otherwise to suggest syphilis. (Compare with editorial in THE JOURNAL, Feb. 27, 1915, p. 748.)